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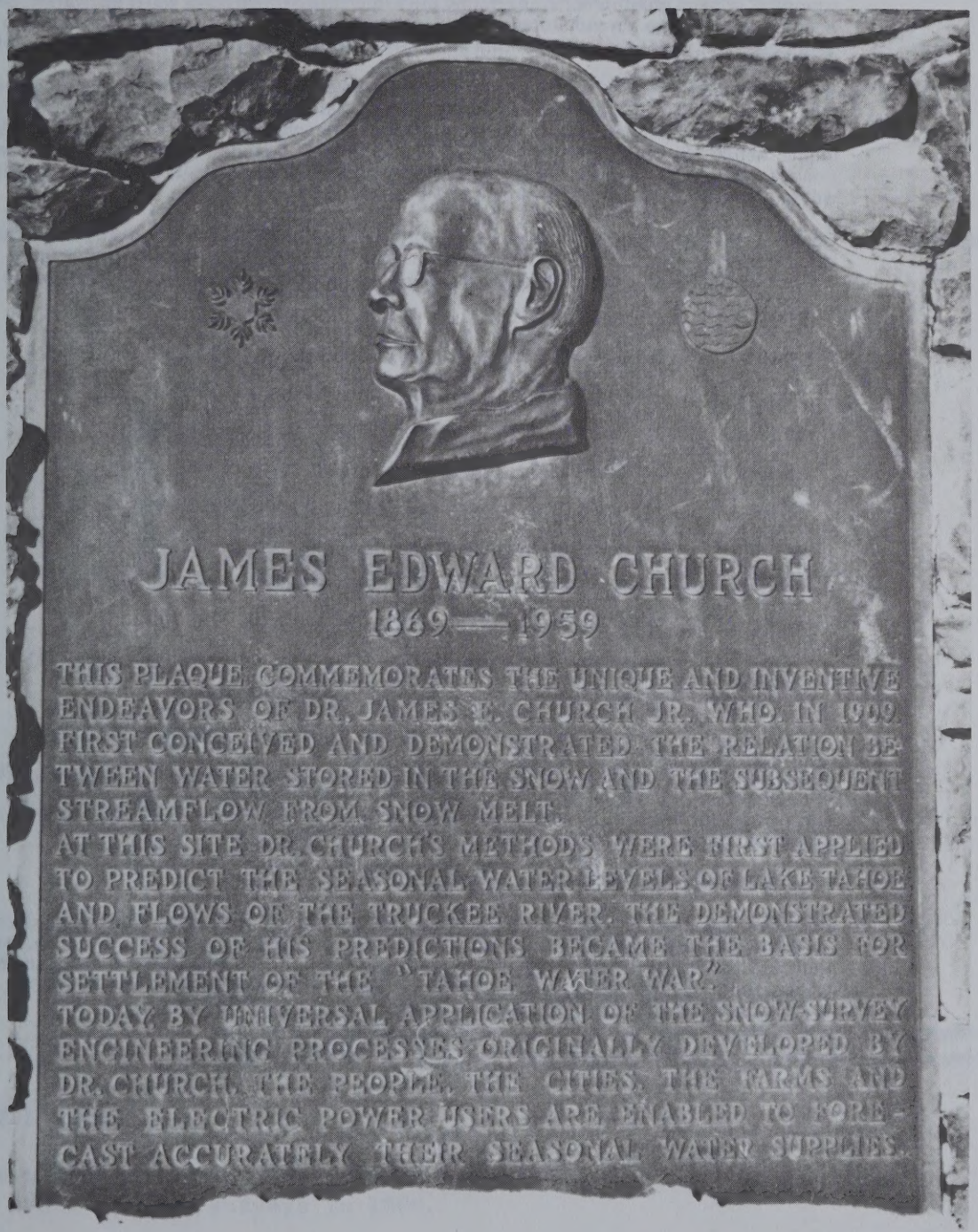
United States
Department of
Agriculture

**Soil
Conservation
Service**

**Bozeman,
Montana**

# Montana
# Water Supply Outlook

## February 1, 1989


JAMES EDWARD CHURCH
1869 — 1959
THIS PLAQUE COMMEMORATES THE UNIQUE AND INVENTIVE ENDEAVORS OF DR. JAMES E. CHURCH JR. WHO IN 1909 FIRST CONCEIVED AND DEMONSTRATED THE RELATION BETWEEN WATER STORED IN THE SNOW AND THE SUBSEQUENT STREAMFLOW FROM SNOW MELT.
AT THIS SITE DR. CHURCH'S METHODS WERE FIRST APPLIED TO PREDICT THE SEASONAL WATER LEVELS OF LAKE TAHOE AND FLOWS OF THE TRUCKEE RIVER. THE DEMONSTRATED SUCCESS OF HIS PREDICTIONS BECAME THE BASIS FOR SETTLEMENT OF THE "TAHOE WATER WAR."
TODAY BY UNIVERSAL APPLICATION OF THE SNOW SURVEY ENGINEERING PROCESSES ORIGINALLY DEVELOPED BY DR. CHURCH, THE PEOPLE, THE CITIES, THE FARMS AND THE ELECTRIC POWER USERS ARE ENABLED TO FORECAST ACCURATELY THEIR SEASONAL WATER SUPPLIES.

# Foreword

## How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

An error is associated with each forecast, and this error decreases as the season progresses and more data becomes available. To express the range of error that can be expected, "most probable" forecasts are issued along with a range representing a "reasonable minimum" and a "reasonable maximum". Actual streamflow can be expected to fall within this range in eight out of ten years. Additionally two specific scenarios are provided based on the assumption that subsequent precipitation will be "wet", above average, or "dry", below average.

## For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

| STATE | ADDRESS |
|---|---|
| Alaska | 201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687 |
| Arizona | 201 East Indianola Ave., Suite 200, Phoenix, AZ 85012 |
| Colorado | 2490 West 26th Ave., Building A, 3rd floor, Denver, CO 80211 |
| Idaho | 3244 Elder Street, Room 124, Boise, ID 83705 |
| Montana | 10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715 |
| Nevada | 1201 Terminal Way, Room 219, Reno, NV 89502 |
| New Mexico | 517 Gold Ave. S.W., Room 3301, Albuquerque, NM 87102-3157 |
| Oregon | 1220 Southwest 3rd Ave., Room 1640, Portland, OR 97204 |
| Utah | 4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147 |
| Washington | W. 920 Riverside, Room 360, Spokane, WA 99201-1080 |
| Wyoming | Federal Building, 100 "B" Street, Room 3124, Casper, WY 82601 |

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

Water supply reports published by other agencies:

California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

# Montana
# Water Supply Outlook

## and

## Federal - State - Private
## Cooperative Snow Surveys

### Issued by

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**Programs and assistance of the United States Department of Agriculture are available without regard to race, creed, color, sex, age, or national origin.**

ON THE COVER:

This plaque on the outlet gate at Lake Tahoe, Nevada, commemorates the start of snow surveys in 1909.

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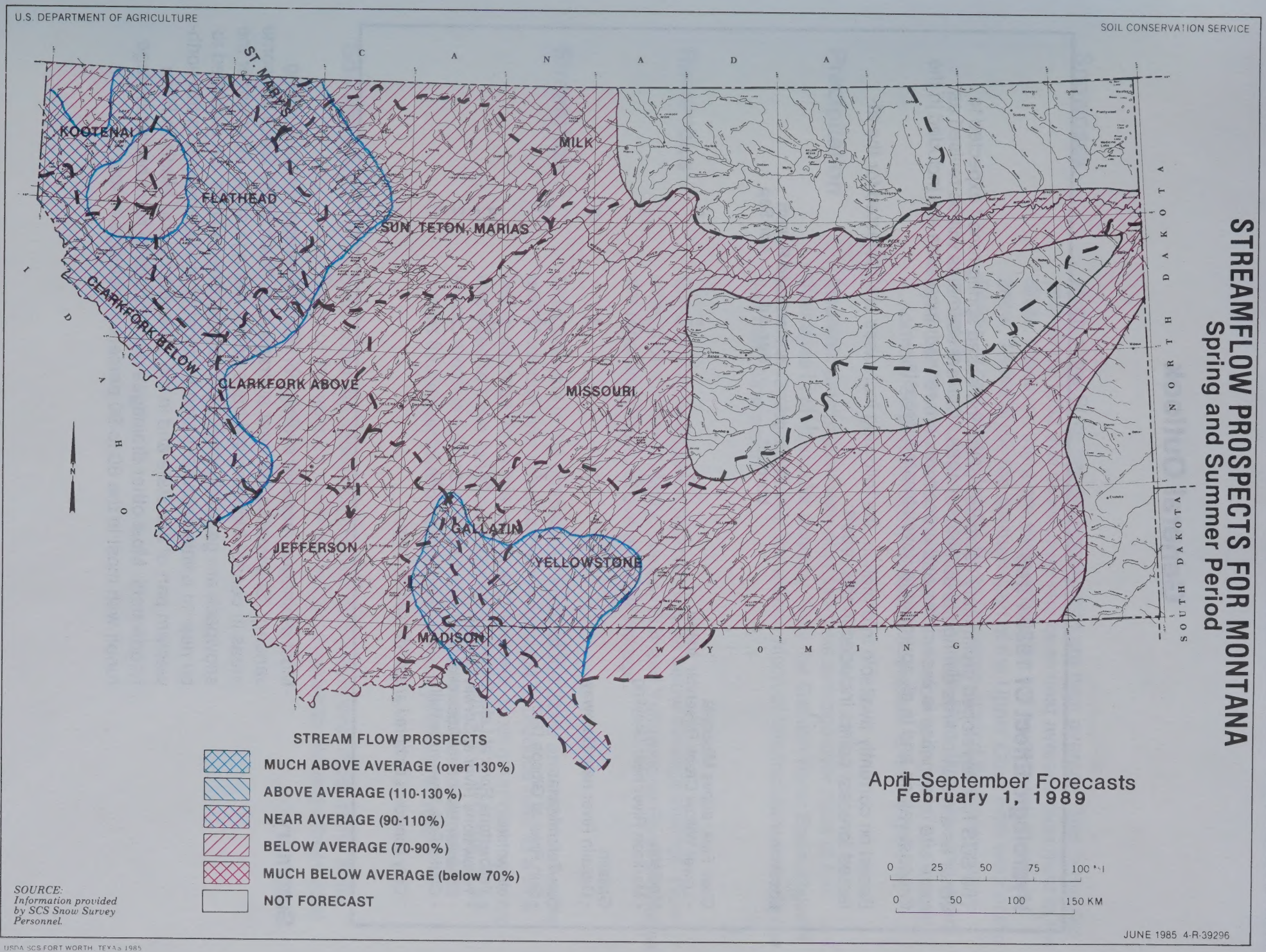





USDA SCS FORT WORTH, TEXAS 1985

# General Outlook

## Hydrologic Effect Of 1988 Fires

The SCS has developed preliminary estimates of the increased spring runoff expected to occur as a result of fires during the summer of 1988. Current estimates will be revised as more site information is assembled and procedures are refined. Increases are included in the forecast values and in all appropriate downstream forecasts.

Based on currently available information, the following increases are projected for the affected forecast points included in this report:

| Location | % Drainage burned* | % Increased Runoff Apr-Jul | Apr-Sep |
|---|---|---|---|
| Clark Fork above Missoula | | | |
| • Lower Willow Creek Reservoir Inflow | 9 | 5 | 5 |
| Madison | | | |
| • Madison River near Grayling | 38 | 13 | 12 |
| Gallatin | | | |
| • Gallatin River near Gateway | 7 | 3 | 3 |
| Sun-Teton-Marias | | | |
| • Sun River at Gibson Dam | 7 | 1 | 1 |
| Yellowstone | | | |
| • Yellowstone River at Lake Outlet | 42 | 15 | 14 |
| • Yellowstone River at Corwin Springs | 41 | 11 | 11 |
| • Stillwater River near Absarokee | 5 | 2 | 2 |
| • Clarks Fork River near Belfry | 10 | 3 | 3 |

* Only considers timbered areas with canopy burn.

## Summary

Most drainages received average or above average moisture during January. Snowpacks are near average over much of the State but some areas in central Montana still have below average snow. Soils under the snowpack are generally drier than normal. Streamflows are expected to be near to a little below average for most of the watersheds in the northwestern part of the State and in the Yellowstone and Madison River headwaters. Most other drainages are forecast to have below average runoff with most in the 80 to 90 percent of average range.

## Snowpack

Much of the State has snowpacks that are near average. This is the first year since 1982 that snow cover has been near average over most of the State. However, there are some areas that still have below average snow. These are in the southern part of the Upper Clark Fork west of the Divide, in part of the Gallatin River Drainage around Bozeman, small mountain ranges in central Montana, the Milk River Drainage and drainages that flow into the Yellowstone River below Livingston. By February 1, normally 60 percent of the season's snowpack is on the ground.

## Precipitation

Mountain precipitation was near to above average over most of the drainages in Montana for January. Only the Gallatin River Basin showed below average moisture for the month. Much of this moisture came in the first half of the month.

## Reservoirs

Generally most irrigation reservoirs have below average storage. However, those in the St. Mary, Marias, Sun and Yellowstone River drainages are reporting near to above average storage.

## Streamflow

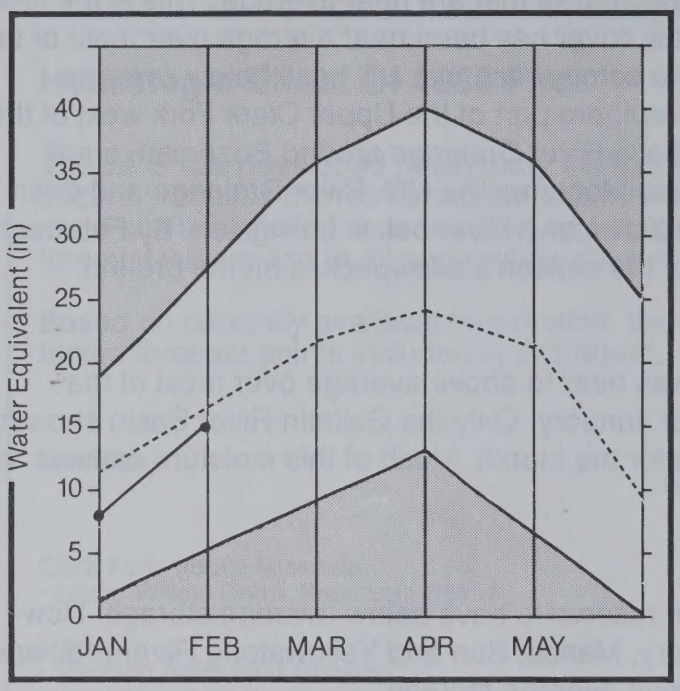
Most streams in the northwestern part of the State and the Yellowstone and Madison River headwaters are forecast to produce near to a little below average flows this spring and summer. Most other drainages are expected to have runoff between 80 and 90 percent of average. In all areas, runoff is expected to be more than was observed last season unless future precipitation patterns show a significant decrease.

## Soil Moisture

Soils under the snowpack are drier than usual over most of the State. Some of this spring's snowmelt will be required to recharge those soils before runoff can begin.

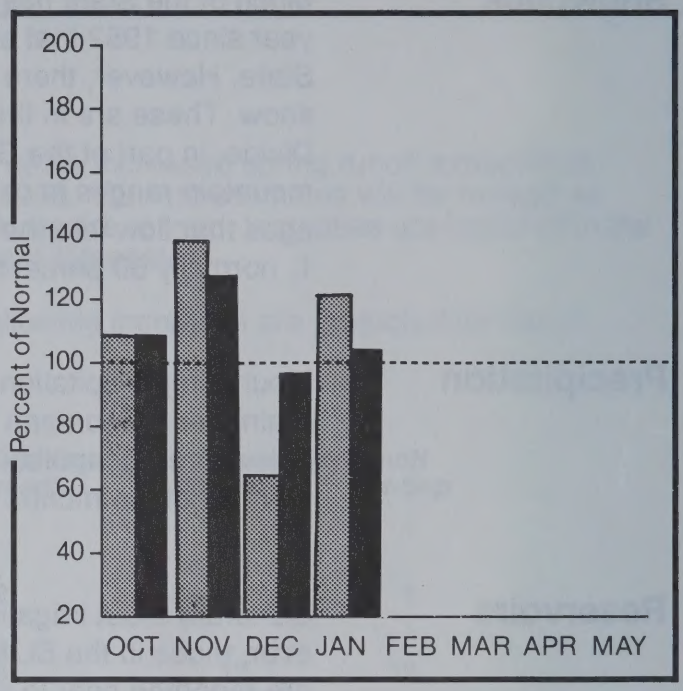
# Kootenai Basin

**Mountain snowpack*** (inches)




*Kootenai in Montana

**Precipitation*** (percent of normal)




*Based on selected stations

Maximum

Minimum

Average

Current

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

Mountain precipitation was above average in January. The snowpack in British Columbia is near average while in Montana it is about 10 percent below average. Spring and summer streamflow is expected to vary from near average on the main stem of the Kootenai River to below average on some of the tributary streams in Montana.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| KOOTENAI bl Libby Dam (2) | APR-JUL | 5600 | 95 | | | 6840 | 4310 | 5885 |
| | APR-SEP | 6570 | 95 | | | 8020 | 5050 | 6903 |
| FISHER nr Libby | APR-JUL | 210 | 88 | 260 | 157 | 275 | 143 | 240 |
| | APR-SEP | 225 | 88 | 270 | 171 | 295 | 153 | 256 |
| YAAK nr Troy | APR-JUL | 415 | 84 | 490 | 335 | 555 | 275 | 494 |
| | APR-SEP | 440 | 85 | 510 | 370 | 585 | 295 | 517 |
| KOOTENAI at Leonia (2) | APR-JUL | 7930 | 96 | | | 8640 | 5420 | 7340 |
| | APR-SEP | 8090 | 96 | | | 9950 | 6230 | 8441 |

RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| LAKE KOOCANUSA | 5748.0 | 1731.0 | 2079.0 | 2494.0 |

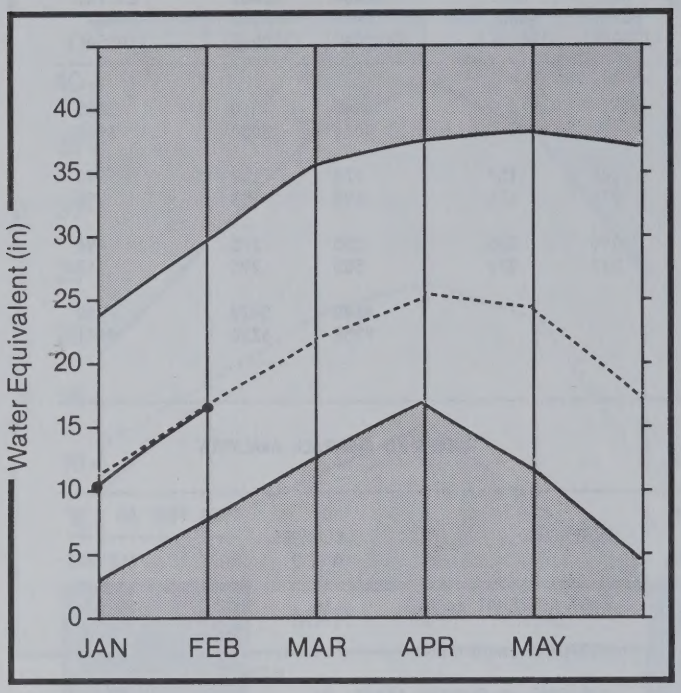
WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | THIS YEAR AS % OF AVERAGE |
|---|---|---|---|
| EAST KOOTENAI in B.C. | 14 | 155 | 104 |
| KOOTENAI in MONTANA | 18 | 144 | 92 |
| KOOTENAI ab BONNERS FERRY | 31 | 141 | 97 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Flathead Basin

**Mountain snowpack*** (inches)




*Flathead

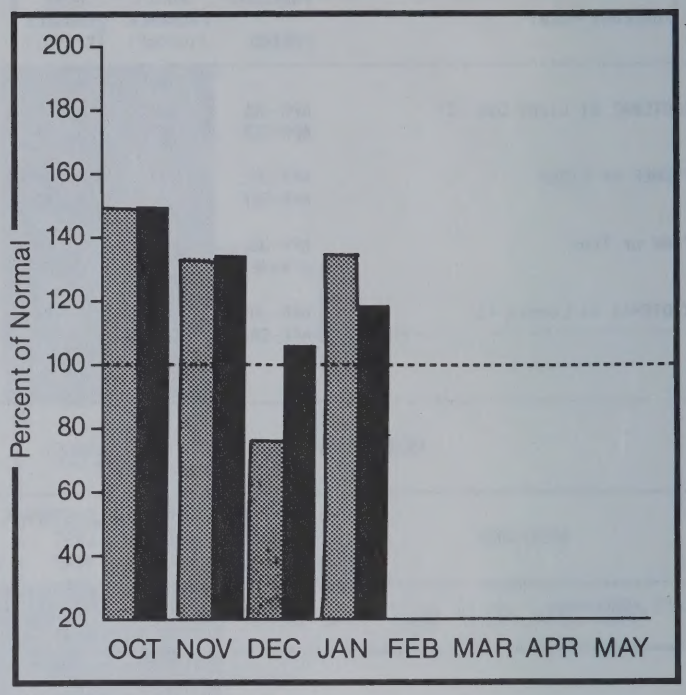
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

During January, the mountain precipitation was above average. This increased the mountain snowpack to near average in most drainages. April through September runoff is forecast to be near average for most watersheds in the Flathead River Drainage.

For more information contact your local Soil Conservation Service office.

## FLATHEAD RIVER BASIN

### STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| NF FLATHEAD nr Columbia Falls | APR-JUL | 1620 | 95 | 1810 | 1430 | 1930 | 1330 | 1701 |
| | APR-SEP | 1800 | 96 | 1990 | 1610 | 2140 | 1460 | 1880 |
| MF FLATHEAD nr West Glacier | APR-JUL | 1610 | 96 | 1830 | 1390 | 1910 | 1310 | 1680 |
| | APR-SEP | 1760 | 96 | 1940 | 1580 | 2090 | 1430 | 1836 |
| SF FLATHEAD nr Columbia Falls (1) | APR-JUL | 2050 | 97 | 2350 | 1820 | 2600 | 1520 | 2110 |
| | APR-SEP | 2190 | 97 | 2460 | 1920 | 2770 | 1610 | 2248 |
| FLATHEAD at Columbia Falls (1) | APR-JUL | 5460 | 97 | 6080 | 4840 | 6700 | 4220 | 5621 |
| | APR-SEP | 5930 | 97 | 6420 | 5440 | 7280 | 4580 | 6114 |
| SWAN nr Bigfork | APR-JUL | 595 | 100 | 655 | 535 | 700 | 490 | 597 |
| | APR-SEP | 670 | 98 | 730 | 610 | 795 | 545 | 683 |
| FLATHEAD nr Polson (2) | APR-JUL | 6490 | 99 | 7150 | 5830 | 7680 | 5370 | 6586 |
| | APR-SEP | 7050 | 99 | 7550 | 6550 | 8340 | 5760 | 7150 |

### RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| CAMAS (4) | 45.2 | 6.2 | 14.9 | 20.1 |
| MISSION VALLEY (8) | 100.0 | 21.7 | 26.4 | 36.8 |
| HUNGRY HORSE | 3451.0 | 1520.0 | 1887.0 | 2406.0 |
| FLATHEAD LAKE | 1791.0 | 782.6 | 840.2 | 1133.0 |

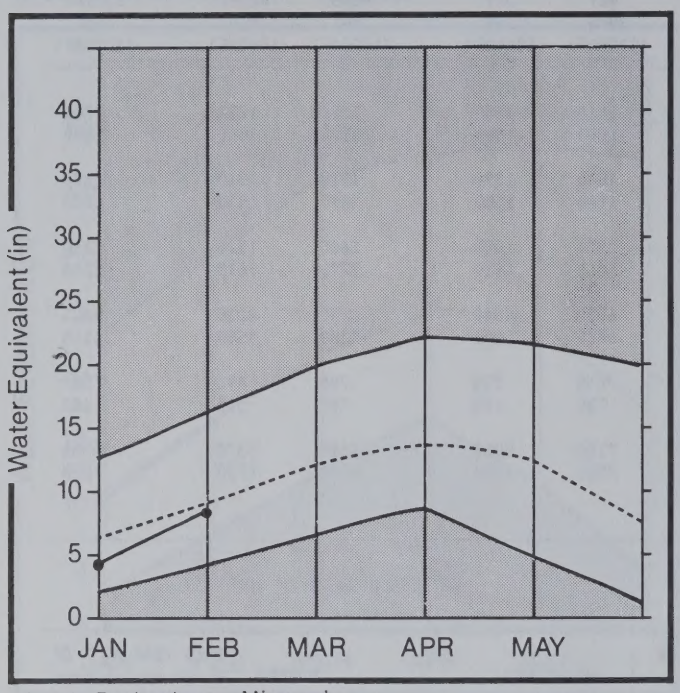
### WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| NORTH FORK FLATHEAD | 14 | 173 | 103 |
| MIDDLE FORK FLATHEAD | 9 | 164 | 95 |
| SOUTH FORK FLATHEAD | 10 | 170 | 101 |
| STILLWATER-WHITEFISH | 5 | 184 | 101 |
| SWAN | 8 | 170 | 108 |
| LITTLE BITTERROOT | 3 | 168 | 82 |
| FLATHEAD | 36 | 170 | 102 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Clark Fork Basin above Missoula

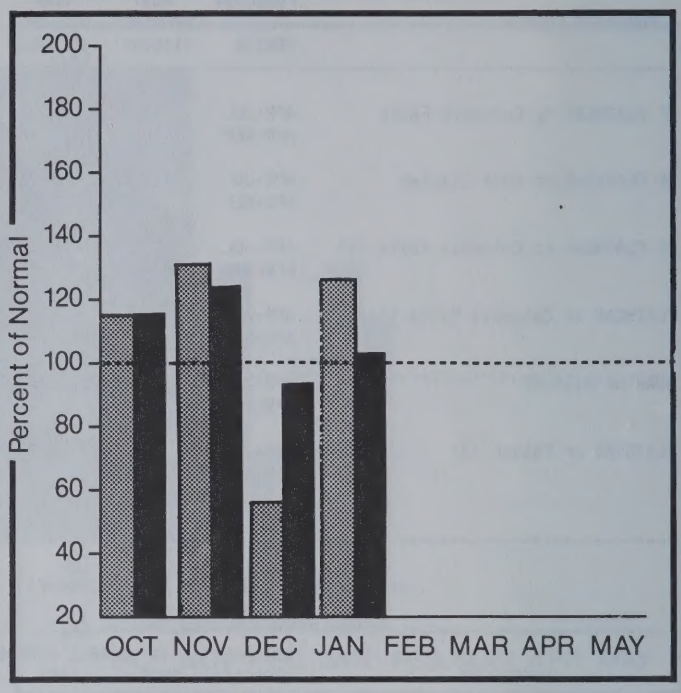
**Mountain snowpack*** (inches)




*Clark Fork above Missoula

Maximum
Minimum
Average
Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation
Year to date precipitation

## Water Supply Outlook

Mountain precipitation was above average for January. The snowpack has increased to below average in the Clark Fork Headwaters and to near average in the Blackfoot River Drainage. Spring and summer runoff is forecast to be a little below average in the Clark Fork Watershed and near average on the Blackfoot River. NOTE: The January 1 forecasts for this basin were printed on page 27 in the January Water Supply Outlook Report.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| MOULTON RESERVOIR inflow (2) | APR-JUN | 180 | 76 | 230 | 130 | 245 | 114 | 237 |
| | APR-JUL | 200 | 76 | 260 | 142 | 275 | 126 | 263 |
| WARM SPRINGS CK nr Anaconda (2) | APR-JUL | 29 | 74 | 36 | 22 | 40 | 18.1 | 39 |
| | APR-SEP | 36 | 73 | 44 | 29 | 50 | 22 | 49 |
| FLINT CK nr Southern Cross (2) | APR-JUL | 12.1 | 82 | 16.8 | 7.4 | 17.7 | 6.5 | 14.8 |
| | APR-SEP | 14.2 | 80 | 19.9 | 8.3 | 21 | 7.4 | 17.8 |
| FLINT CK bl Boulder Ck (2) | APR-JUL | 51 | 84 | 69 | 32 | 74 | 28 | 61 |
| | APR-SEP | 65 | 83 | 85 | 42 | 95 | 35 | 78 |
| LOWER WILLOW CK RES inflow (2) | APR-JUL | 12.4 | 84 | 19.0 | 5.8 | 18.1 | 6.7 | 14.9 |
| | APR-SEP | 13.7 | 87 | 19.7 | 7.7 | 19.7 | 7.7 | 15.8 |
| MF ROCK CK nr Philipsburg | APR-JUL | 64 | 93 | 76 | 52 | 83 | 45 | 69 |
| | APR-SEP | 71 | 92 | 83 | 59 | 93 | 49 | 77 |
| NEVADA CK nr Finn | APR-JUL | 16.3 | 78 | 23 | 10.0 | 24 | 8.3 | 21 |
| | APR-SEP | 17.5 | 80 | 25 | 10.9 | 26 | 9.1 | 22 |
| BLACKFOOT nr Bonner | APR-JUL | 820 | 94 | 995 | 635 | 970 | 665 | 874 |
| | APR-SEP | 910 | 94 | 1080 | 715 | 1080 | 735 | 969 |
| CLARK FORK ab Milltown (2) | APR-JUL | 595 | 85 | 750 | 440 | 835 | 355 | 703 |
| | APR-SEP | 685 | 84 | 840 | 530 | 960 | 410 | 812 |
| CLARK FORK ab Missoula | APR-JUL | 1410 | 89 | 1730 | 1060 | 2010 | 810 | 1577 |
| | APR-SEP | 1590 | 89 | 1950 | 1230 | 2270 | 915 | 1781 |

RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| GEORGETOWN LAKE | 31.0 | 25.3 | 26.5 | 27.2 |
| LOWER WILLOW CREEK | 4.9 | 0.8 | 1.3 | 1.5 |
| NEVADA CREEK | | NO REPORT | | |

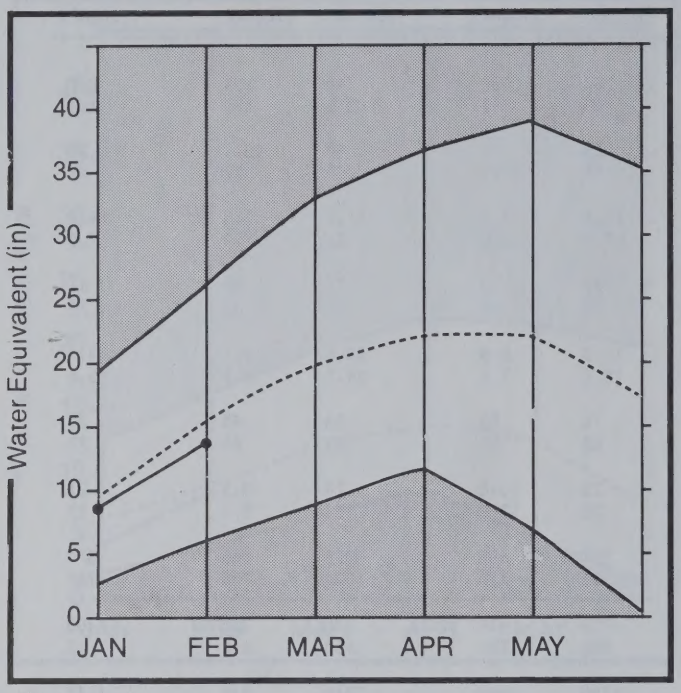
WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| CLARK FORK ab BLACKFOOT | 32 | 133 | 87 |
| BLACKFOOT | 16 | 156 | 98 |
| CLARK FORK above MISSOULA | 43 | 141 | 96 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Clark Fork Basin below Missoula

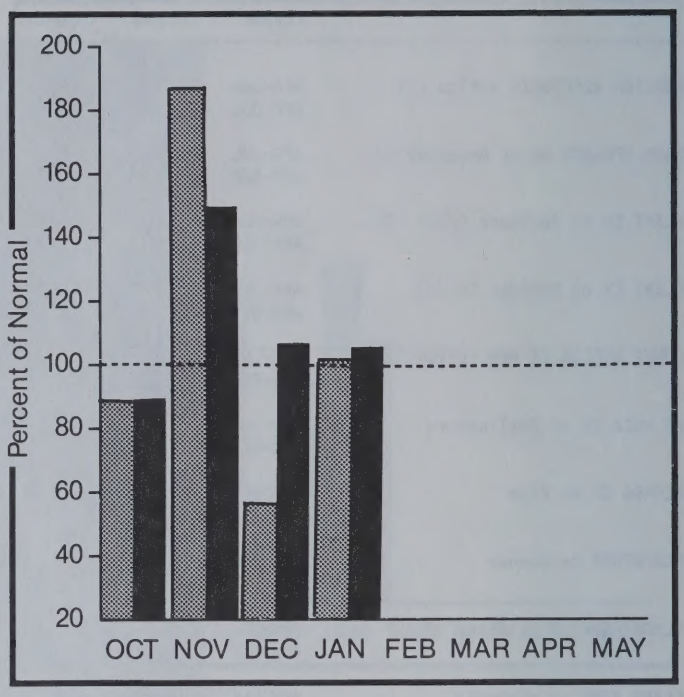
**Mountain snowpack*** (inches)




*Bitterroot

Maximum
Minimum
Average
Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation
Year to date precipitation

## Water Supply Outlook

Mountain precipitation for January was near average over the basin. The snowpack remains a little below average on the Bitterroot River Headwaters and on the headwaters of streams flowing into the Clark Fork River below Missoula. Streamflow is forecast to be a little below average from most drainages.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| CLARK FORK ab Missoula | APR-JUL | 1410 | 89 | 1730 | 1060 | 2010 | 810 | 1577 |
| | APR-SEP | 1590 | 89 | 1950 | 1230 | 2270 | 915 | 1781 |
| WF BITTERROOT nr Conner (2) | APR-JUL | 142 | 97 | 183 | 99 | 183 | 101 | 147 |
| | APR-SEP | 154 | 91 | 196 | 110 | 200 | 107 | 169 |
| BITTERROOT nr Darby | APR-JUL | 505 | 96 | 620 | 390 | 650 | 360 | 524 |
| | APR-SEP | 555 | 97 | 670 | 435 | 715 | 395 | 573 |
| ROCK CK nr Darby | APR-JUL | 80 | 101 | | | 95 | 65 | 80 |
| | APR-SEP | 84 | 100 | | | 99 | 69 | 84 |
| SKALKAHO CK nr Hamilton | APR-JUL | 43 | 93 | 53 | 34 | 51 | 35 | 46 |
| | APR-SEP | 49 | 91 | 59 | 39 | 59 | 39 | 54 |
| BURNT FORK CK nr Stevensville (2) | APR-JUL | 29 | 91 | 34 | 24 | 38 | 20 | 32 |
| | APR-SEP | 34 | 89 | 40 | 29 | 45 | 23 | 38 |
| BITTERROOT at Missoula (2) | APR-JUL | 1320 | 96 | 1570 | 1070 | 1700 | 920 | 1371 |
| | APR-SEP | 1430 | 96 | 1700 | 1160 | 1850 | 1010 | 1497 |
| CLARK FORK bl Missoula | APR-JUL | 2730 | 93 | 3320 | 2140 | 3320 | 2140 | 2948 |
| | APR-SEP | 3030 | 92 | 3620 | 2440 | 3690 | 2370 | 3276 |
| CLARK FORK at St. Regis | APR-JUL | 3590 | 92 | | | 5070 | 2110 | 3894 |
| | APR-SEP | 3980 | 92 | | | 5620 | 2340 | 4325 |
| CLARK FORK nr Plains (2) | APR-JUL | 10300 | 95 | | | 13200 | 7370 | 10850 |
| | APR-SEP | 11300 | 95 | | | 14500 | 8080 | 11930 |
| THOMPSON nr Thompson Falls | APR-JUL | 180 | 81 | 215 | 144 | 240 | 122 | 222 |
| | APR-SEP | 205 | 82 | 240 | 175 | 270 | 140 | 250 |
| PROSPECT CK at Thompson Falls | APR-JUL | 115 | 90 | 133 | 97 | 151 | 79 | 128 |
| | APR-SEP | 124 | 91 | 142 | 106 | 162 | 86 | 137 |
| CLARK FORK at Whitehorse Rapids (2) | APR-JUL | 11300 | 93 | | | 14600 | 7900 | 12150 |
| | APR-SEP | 12400 | 93 | | | 16100 | 8660 | 13370 |

### RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| PAINTED ROCKS LAKE | 31.7 | 0.0 | --- | 15.2 |
| NOXON RAPIDS | 335.0 | 325.1 | 324.7 | 314.2 |
| COMO | 34.9 | 9.9 | 5.0 | 11.4 |

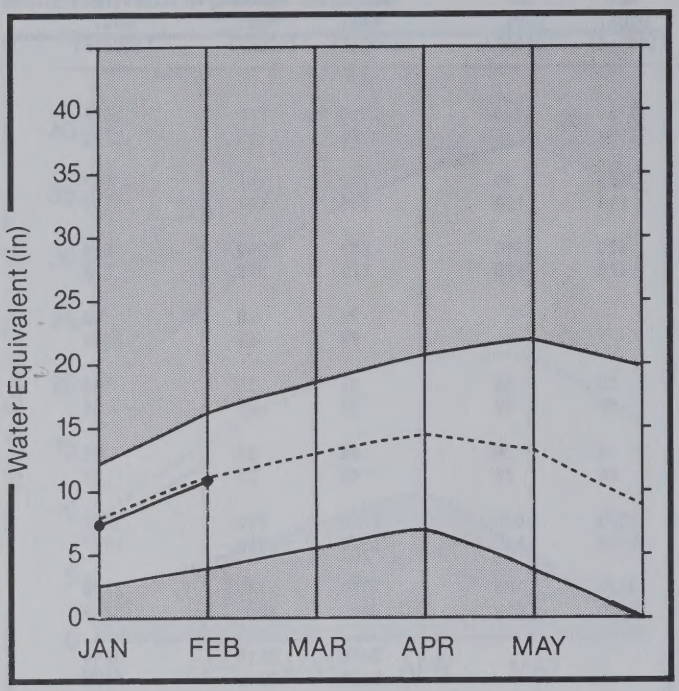
### WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | THIS YEAR AS % OF AVERAGE |
|---|---|---|---|
| CLARK FORK above MISSOULA | 43 | 141 | 90 |
| BITTERROOT | 14 | 135 | 96 |
| LWR CLARK FK blw MISSOULA | 16 | 156 | 91 |
| BITTERROOT & LWR C.F. | 28 | 148 | 94 |
| CLARK FORK TOTAL | 68 | 146 | 93 |
| FLATHEAD | 35 | 170 | 102 |
| PEND O'REILLE | 98 | 155 | 95 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Jefferson Basin

**Mountain snowpack*** (inches)




*Jefferson

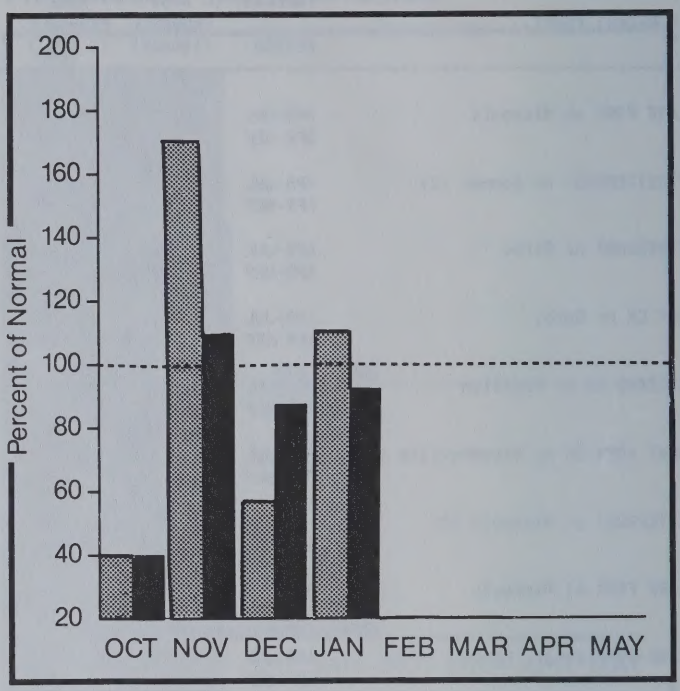
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

January mountain precipitation was a little above average. Snowpack is above average in the Red Rock River Drainage, a little below average in the Ruby and Big Hole River headwaters and below average in the Boulder River Watershed. Forecasts for April through September runoff are 10 to 15 percent below average. Soils under the snowpack are drier than normal.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| RED ROCK RIVER near Monida 2 | APR-JUL | 93 | 89 | 135 | 51 | 131 | 55 | 105 |
| | APR-SEP | 99 | 87 | 147 | 51 | 140 | 58 | 114 |
| BEAVERHEAD RIVER near Grant 2 | APR-JUL | 128 | 86 | 245 | 62 | 182 | 74 | 149 |
| | APR-SEP | 147 | 84 | 295 | 77 | 210 | 84 | 175 |
| BEAVERHEAD RIVER at Barratts 2 | APR-JUL | 160 | 83 | 285 | 77 | 230 | 91 | 192 |
| | APR-SEP | 183 | 82 | 340 | 91 | 265 | 102 | 224 |
| RUBY RIVER near Alder | APR-JUL | 75 | 84 | 109 | 41 | 105 | 45 | 89 |
| | APR-SEP | 91 | 86 | 126 | 56 | 127 | 55 | 106 |
| BIG HOLE RIVER near Melrose | APR-JUL | 580 | 83 | 915 | 245 | 805 | 355 | 696 |
| | APR-SEP | 650 | 86 | 1010 | 285 | 890 | 410 | 757 |
| WILLOW CREEK near Harrison | APR-JUL | 15.0 | 80 | 29 | 7.0 | 22 | 7.9 | 18.7 |
| | APR-SEP | 16.6 | 79 | 33 | 7.4 | 25 | 8.6 | 21 |
| BOULDER RIVER near Boulder | APR-JUL | 78 | 86 | 142 | 37 | 108 | 48 | 91 |
| | APR-SEP | 84 | 87 | 152 | 39 | 116 | 52 | 97 |
| JEFFERSON RIVER near Three Forks | APR-JUL | 840 | 81 | 1530 | 390 | 1220 | 465 | 1042 |
| | APR-SEP | 950 | 82 | 1690 | 440 | 1370 | 535 | 1156 |

## RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| LIMA | 84.0 | 9.8 | 11.6 | 35.6 |
| CLARK CANYON | 255.6 | 103.1 | 167.3 | 144.5 |
| RUBY RIVER | 38.8 | 21.1 | 23.0 | 23.8 |

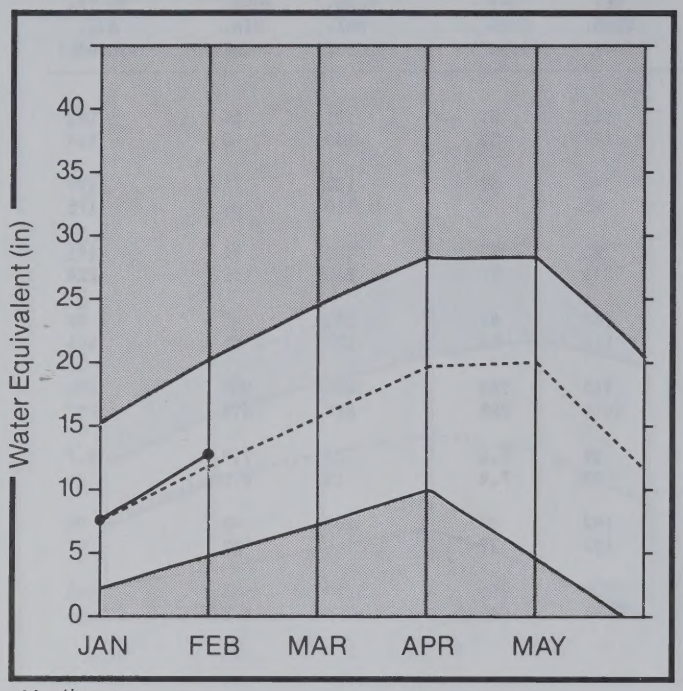
## WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| BEAVERHEAD | 19 | 171 | 120 |
| RUBY | 4 | 151 | 97 |
| BIGHOLE | 17 | 137 | 95 |
| BOULDER | 13 | 147 | 86 |
| JEFFERSON | 44 | 157 | 104 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Madison Basin

**Mountain snowpack*** (inches)




*Madison

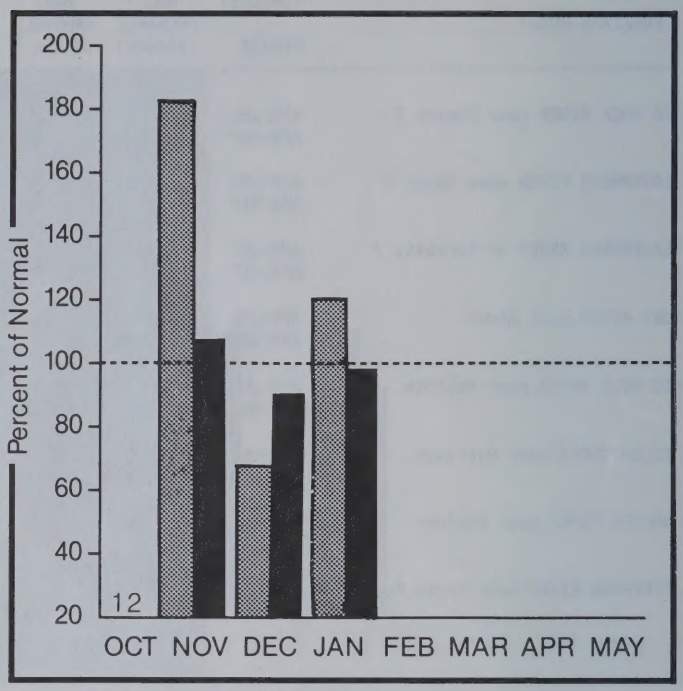
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

The mountain precipitation for January was above average over the basin. The snowpack in the upper basin is above average and near average in the lower part of the watershed. Runoff is forecast to be a little above average as a result of good snow cover and increased yield due to this past summer's fires. NOTE: For more information see Hydrologic Effect of the 1988 Fires on Page 4 of the Water Supply Outlook Report.

For more information contact your local Soil Conservation Service office.

## MADISON RIVER BASIN

### STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| MADISON RIVER near Grayling 2 | APR-JUL | 425 | 109 | 540 | 310 | 500 | 350 | 390 |
| | APR-SEP | 535 | 107 | 675 | 395 | 630 | 440 | 499 |
| MADISON RIVER near McAllister 2 | APR-JUL | 715 | 105 | 975 | 455 | 850 | 580 | 680 |
| | APR-SEP | 885 | 103 | 1170 | 610 | 1060 | 715 | 856 |

### RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| ENNIS LAKE | 41.0 | 31.0 | 31.6 | 34.7 |
| HEBGEN LAKE | 377.5 | 266.3 | 275.2 | 242.0 |

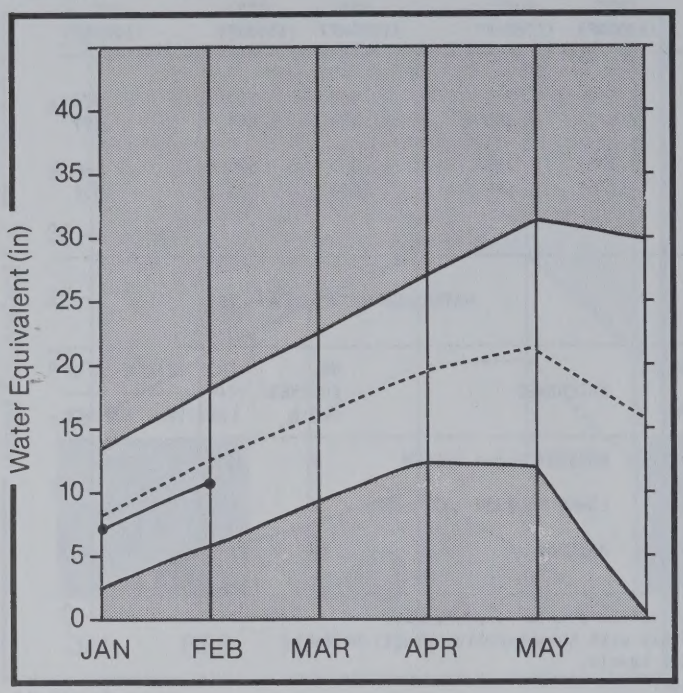
### WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| MADISON above HEBGEN | 9 | 150 | 105 |
| LOWER MADISON | 9 | 143 | 96 |
| MADISON | 18 | 147 | 101 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Gallatin Basin

**Mountain snowpack*** (inches)




*Gallatin

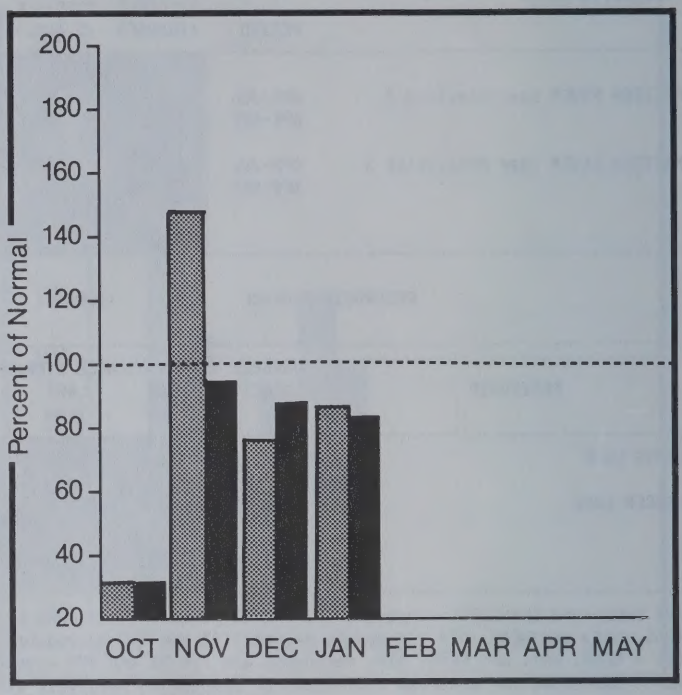
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

During January, mountain precipitation was a little below average. The snowpack is now about 15 to 20 percent below average over the basin. Spring and summer runoff is expected to be 10 to 15 percent below average on most streams. However, this is much greater than last year's runoff.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| GALLATIN RIVER near Gateway | APR-JUL | 410 | 89 | 610 | 210 | 500 | 320 | 460 |
| | APR-SEP | 480 | 89 | 680 | 280 | 590 | 370 | 540 |
| E & W FK. HYALITE CR. nr Bozeman 2 | APR-JUL | 21 | 88 | 31 | 10.9 | 26 | 16.0 | 24 |
| | APR-SEP | 24 | 86 | 36 | 12.2 | 30 | 18.1 | 28 |
| HYALITE CREEK near Bozeman 2 | APR-JUL | 33 | 87 | 52 | 14.0 | 41 | 25 | 38 |
| | APR-SEP | 37 | 84 | 58 | 16.3 | 47 | 27 | 44 |
| GALLATIN RIVER at Logan | APR-JUL | 460 | 87 | 795 | 205 | 610 | 310 | 528 |
| | APR-SEP | 530 | 86 | 875 | 265 | 700 | 360 | 616 |

### RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| MIDDLE CREEK | 8.0 | 3.7 | 6.1 | 3.4 |

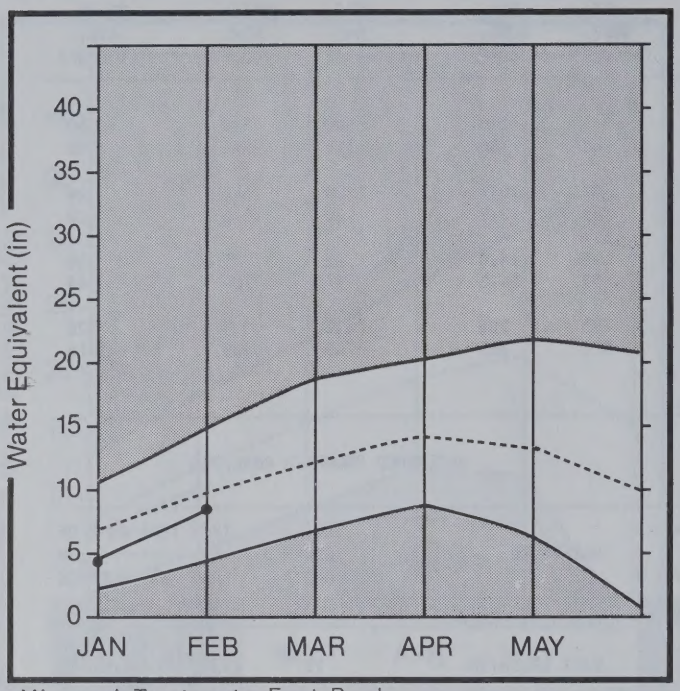
### WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| UPPER GALLATIN | 9 | 135 | 85 |
| EAST GALLATIN | 12 | 130 | 80 |
| GALLATIN | 18 | 134 | 85 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Missouri Basin

**Mountain snowpack*** (inches)




*Missouri Toston to Fort Peck

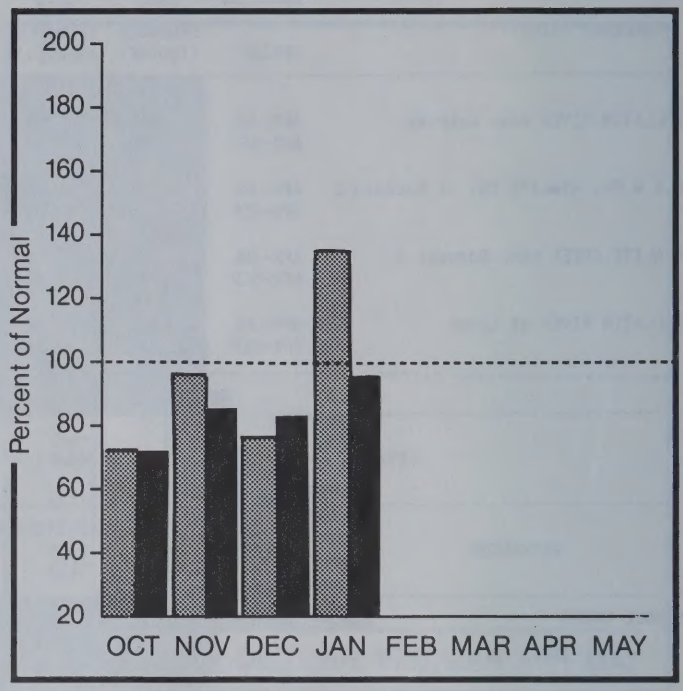
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

January precipitation was above average in the mountains. This raised the snowpack levels up from January 1 but it still remains below average in most drainages. Streamflow forecasts are for below average runoff on most watersheds.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| MISSOURI RIVER at Toston 2 | APR-JUL | 2020 | 90 | | | 2670 | 1390 | 2250 |
| | APR-SEP | 2340 | 90 | | | 3090 | 1590 | 2590 |
| PRICKLY PEAR CREEK nr Clancy | APR-JUL | 21 | 81 | 37 | 9.0 | 32 | 10.1 | 26 |
| | APR-SEP | 25 | 81 | 44 | 11.1 | 38 | 12.0 | 31 |
| SMITH RIVER nr Ft. Logan | APR-JUL | 54 | 79 | 103 | 24 | 81 | 27 | 68 |
| | APR-SEP | 65 | 81 | 118 | 28 | 97 | 33 | 80 |
| SHEEP CREEK nr White Sulphur Spgs. | APR-JUL | 15.6 | 83 | 23 | 8.3 | 23 | 7.7 | 18.8 |
| | APR-SEP | 18.5 | 84 | 26 | 9.9 | 28 | 9.3 | 22 |
| BELT CREEK near Monarch | APR-JUL | 96 | 78 | 160 | 32 | 143 | 49 | 123 |
| | APR-SEP | 104 | 78 | 171 | 37 | 155 | 53 | 134 |
| MISSOURI RIVER at Fort Benton 2 | APR-JUL | 2930 | 84 | | | 4110 | 1820 | 3470 |
| | APR-SEP | 3540 | 89 | | | 4900 | 2220 | 3990 |
| MISSOURI RIVER at Virgelle 2 | APR-JUL | 3400 | 86 | | | 5060 | 2050 | 3960 |
| | APR-SEP | 4000 | 89 | | | 5890 | 2430 | 4500 |
| MISSOURI RIVER near Landusky 2 | APR-JUL | 3760 | 87 | | | 5570 | 2170 | 4310 |
| | APR-SEP | 4430 | 90 | | | 6540 | 2620 | 4900 |
| N.F. MUSSELSHELL near Delpine | APR-JUL | 4.8 | 87 | 7.8 | 1.8 | 7.2 | 2.4 | 5.6 |
| | APR-SEP | 5.6 | 89 | 8.9 | 2.3 | 8.3 | 2.9 | 6.4 |
| S.F. MUSSELSHELL above Martinsdale | APR-JUL | 49 | 86 | 85 | 11.9 | 73 | 25 | 57 |
| | APR-SEP | 51 | 84 | 89 | 13.2 | 77 | 25 | 61 |
| MISSOURI RIVER below Fort Peck 2 | APR-JUL | 3790 | 89 | | | 5750 | 2170 | 4260 |
| | APR-SEP | 4340 | 90 | | | 6550 | 2470 | 4800 |
| LAKE SAKAKAWEA Inflow 2 | APR-JUL | 9680 | 88 | | | 13800 | 5940 | 11000 |
| | APR-SEP | 10800 | 89 | | | 15300 | 6770 | 12200 |

## RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| CANYON FERRY LAKE | 2043.0 | 1377.0 | 1453.0 | 1621.0 |
| HELENA VALLEY | 9.2 | 4.9 | 5.6 | 5.2 |
| LAKE HELENA | 10.4 | 10.9 | 11.1 | 10.2 |
| HAUSER & HELENA | 61.9 | 63.1 | 63.6 | 60.9 |
| HOLTER LAKE | 81.9 | 80.0 | 78.6 | 71.6 |
| SMITH RIVER | 10.6 | 1.5 | 2.4 | 6.7 |
| NEWLAN CREEK | | NO REPORT | | |
| BAIR | 7.0 | 0.6 | 1.9 | 4.0 |
| MARTINSDALE | 23.1 | 0.2 | 3.1 | 9.9 |
| DEADMAN'S BASIN | 72.2 | 13.2 | 37.8 | 45.2 |
| FORT PECK LAKE* | 18.9 | 12.4 | 15.0 | 15.1 |

*Million Acre Feet

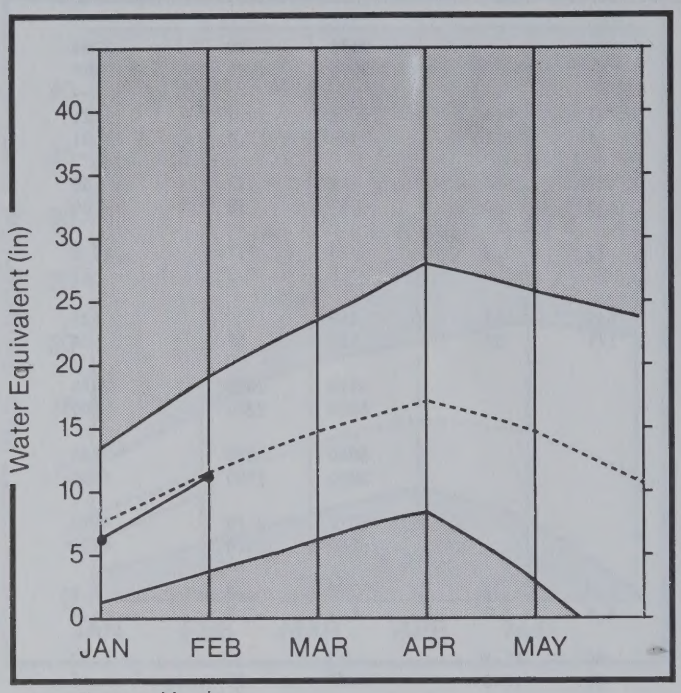
## WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| MISSOURI HEADWATERS | 71 | 150 | 100 |
| WEST SIDE MISSOURI | 8 | 156 | 87 |
| SMITH-BELT | 5 | 151 | 92 |
| MISSOURI MAINSTEM | 13 | 153 | 90 |
| SUN-TETON-MARIAS | 9 | 164 | 99 |
| JUDITH-MUSSELSHELL | 8 | 135 | 82 |
| MISSOURI above FORT PECK | 91 | 151 | 99 |
| MILK HEADWATERS | 4 | 189 | 89 |
| BEAR PAW | 7 | 94 | 65 |
| MILK RIVER | 11 | 153 | 82 |
| MISSOURI in MONTANA | 100 | 151 | 98 |
| MISSOURI blw YELLOWSTONE | 185 | 137 | 90 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Sun, Teton and Marias Basins

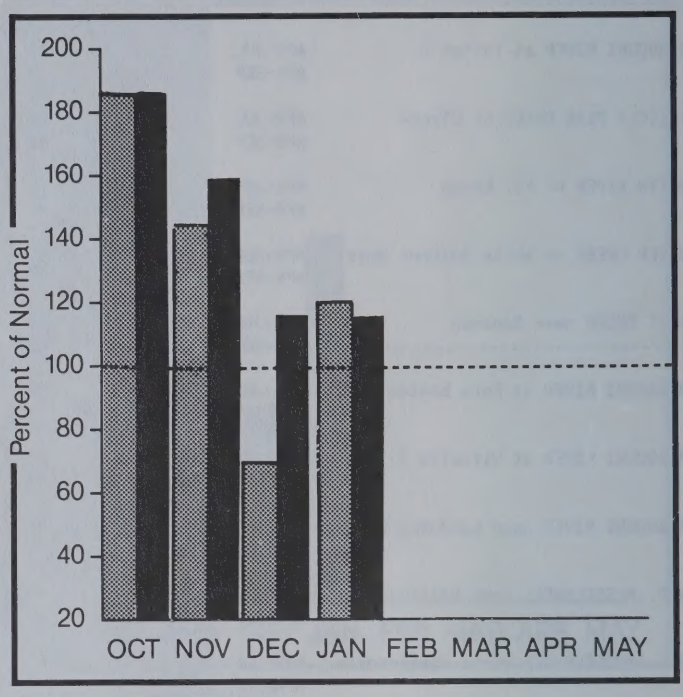
**Mountain snowpack*** (inches)




*Sun-Teton-Marias

Maximum
Minimum
Average
Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation
Year to date precipitation

## Water Supply Outlook

Mountain precipitation was above average in January. Snowpack percentages increased during the past month and is now only a little below average. Spring and summer runoff is forecast to be near to a little below average on most drainages.

For more information contact your local Soil Conservation Service office.

SUN-TETON-MARIAS RIVER BASINS

STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| SUN RIVER at Gibson Dam 2 | APR-JUL | 435 | 88 | 615 | 255 | 565 | 305 | 494 |
| | APR-SEP | 475 | 88 | 665 | 290 | 615 | 335 | 542 |
| TWO MEDICINE CREEK near Browning 2 | APR-JUL | 215 | 97 | 305 | 126 | 300 | 131 | 222 |
| | APR-SEP | 225 | 96 | 315 | 136 | 310 | 140 | 235 |
| BADGER CREEK near Browning | APR-JUL | 105 | 98 | 142 | 68 | 146 | 64 | 107 |
| | APR-SEP | 122 | 99 | 163 | 81 | 166 | 78 | 123 |
| SWIFT RESERVOIR Inflow nr Dupuyer | APR-JUL | 67 | 96 | 91 | 43 | 94 | 40 | 70 |
| | APR-SEP | 78 | 95 | 103 | 53 | 108 | 48 | 82 |
| MARIAS RIVER near Shelby | APR-JUL | 405 | 85 | | | 745 | 250 | 478 |
| | APR-SEP | 425 | 85 | | | 780 | 260 | 501 |

RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| GIBSON | 99.1 | 24.8 | 51.0 | 43.0 |
| PISHKUN | 32.0 | 19.7 | 18.3 | 17.1 |
| WILLOW CREEK | 32.2 | 23.0 | 23.9 | 20.4 |
| LOWER TWO MEDICINE LAKE | 11.9 | 11.9 | 10.3 | 7.7 |
| FOUR HORNS LAKE | 19.2 | 14.0 | 13.7 | 12.3 |
| SWIFT | 30.0 | 11.6 | 23.2 | 13.6 |
| LAKE FRANCES | 112.0 | 41.6 | 93.9 | 68.5 |
| LAKE ELWELL (TIBER) | 1347.0 | 646.8 | 689.8 | 558.0 |

WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| SUN-TETON | 4 | 141 | 99 |
| MARIAS | 5 | 166 | 99 |
| SUN-TETON-MARIAS | 9 | 164 | 99 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
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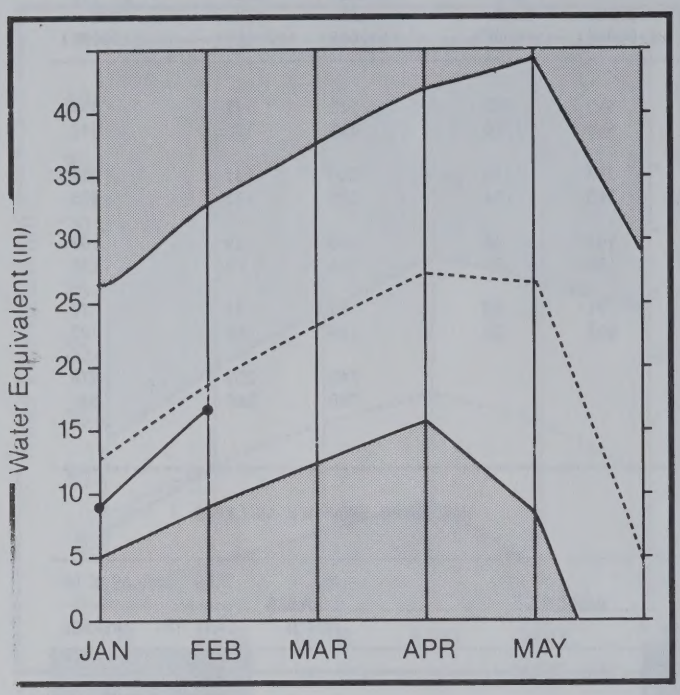
(2) - Corrected for upstream diversions or changes in reservoir storage.

# St. Mary and Milk Basins

**Mountain snowpack*** (inches)




St. Mary

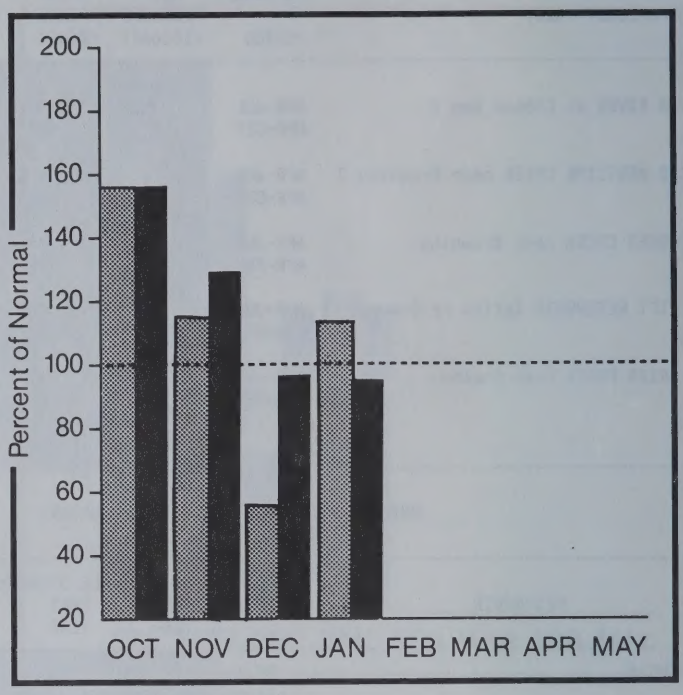
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

January mountain precipitation was a little above average. Snowpack is a little below average in the Milk and St. Mary River headwaters and well below average in the Bear Paw Mountains. Runoff is forecast to be a little below average on the St. Mary River. The natural flow of the Milk River is expected to be below average.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| SWIFTCURRENT CREEK at Sherburne 2 | APR-JUL | 101 | 92 | 123 | 79 | 127 | 75 | 110 |
| | APR-SEP | 119 | 93 | 141 | 97 | 150 | 88 | 128 |
| ST. MARY RIVER near Babb 2 | APR-JUL | 370 | 92 | 460 | 275 | 445 | 295 | 404 |
| | APR-SEP | 430 | 91 | 525 | 335 | 515 | 345 | 474 |
| MILK RIVER at Eastern Crossing | MAR-SEP | 73 | 75 | | | 127 | 53 | 97 |
| MILK RIVER at Eastern Crossing 2 | MAR-SEP | 235 | 87 | | | 320 | 168 | 270 |

## RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| LAKE SHERBURNE | 64.3 | 28.4 | 37.3 | 21.8 |
| FRESNO | 127.0 | 6.6 | 61.1 | 51.2 |
| BEAVER CREEK | 3.5 | 0.5 | 2.8 | 1.8 |
| NELSON | 66.8 | 3.7 | 44.4 | 37.3 |

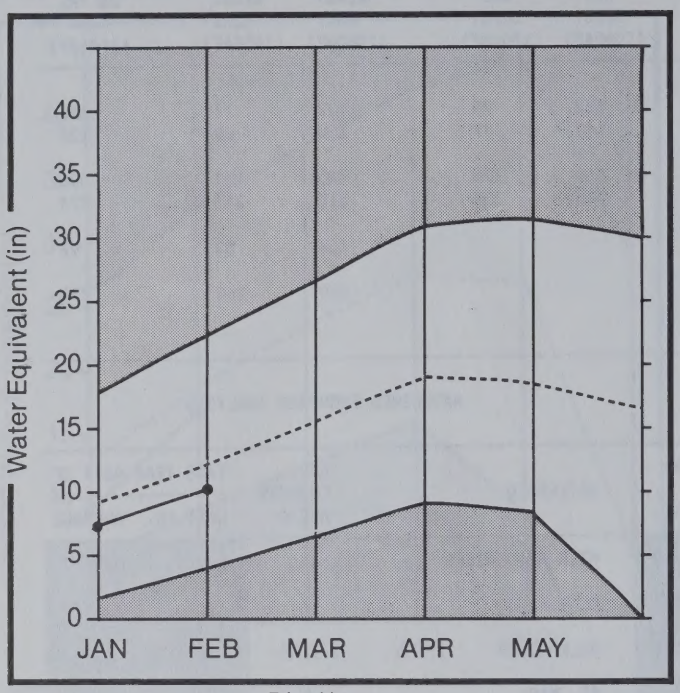
## WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| MILK HEADWATERS | 4 | 189 | 89 |
| BEAR PAW | 7 | 94 | 65 |
| MILK RIVER | 11 | 153 | 82 |
| ST. MARY | 5 | 175 | 90 |
| ST. MARY and MILK | 12 | 154 | 85 |
| BOW RIVER in ALBERTA | 7 | 147 | 98 |
| OLDMAN RIVER in ALBERTA | 5 | 160 | 126 |

WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Yellowstone Basin

**Mountain snowpack*** (inches)




*Yellowstone above Big Horn

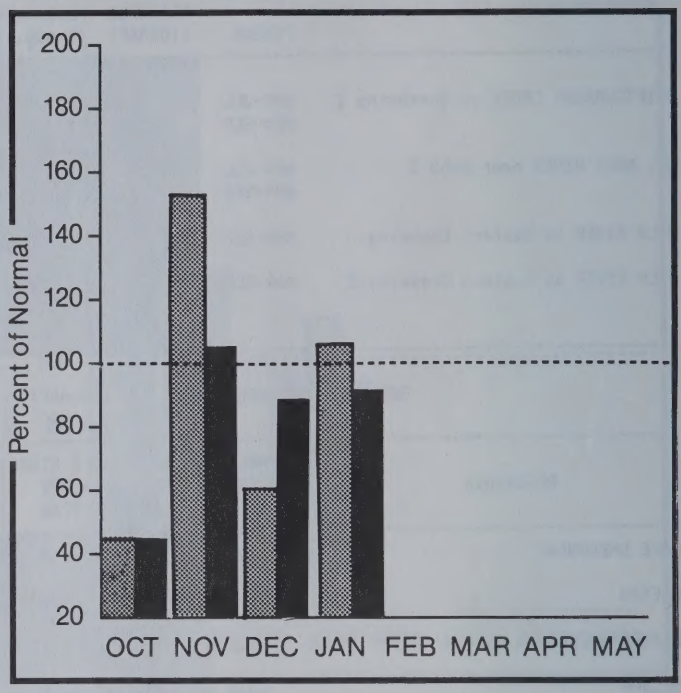
Maximum

Minimum

Average

Current

**Precipitation*** (percent of normal)




*Based on selected stations

Monthly precipitation

Year to date precipitation

## Water Supply Outlook

During January, the mountain precipitation was near average across the basin. The snowpack is a little below average in Yellowstone National Park and in the headwaters of the Boulder and Stillwater Rivers and below average elsewhere. Spring and summer runoff is expected to be a little below average from the Boulder, Stillwater and Upper Yellowstone Rivers. Other streams are forecast to have below average runoff. NOTE: For more information, see the Hydrologic Effect of 1988 Fires on page 4 of the Water Supply Outlook Report. The Yellowstone Forecasts were not printed in the January 1 Water Supply Outlook Report. If you need a copy of these forecasts, please contact the Snow Survey Office in Bozeman.

For more information contact your local Soil Conservation Service office.

## STREAMFLOW FORECASTS

| FORECAST POINT | FORECAST PERIOD | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVG.) | WET SUBS. (1000AF) | DRY SUBS. (1000AF) | REAS. MAX. (1000AF) | REAS. MIN. (1000AF) | 25 YR. AVG. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| YELLOWSTONE at Lake Outlet | APR-JUL | 615 | 104 | 775 | 455 | 715 | 515 | 590 |
| | APR-SEP | 865 | 106 | 1090 | 635 | 1000 | 725 | 818 |
| YELLOWSTONE at Corwin Springs | APR-JUL | 1610 | 98 | 2110 | 1130 | 1910 | 1310 | 1650 |
| | APR-SEP | 1960 | 98 | 2560 | 1360 | 2320 | 1600 | 2000 |
| YELLOWSTONE near Livingston | APR-JUL | 1820 | 95 | 2400 | 1240 | 2170 | 1470 | 1920 |
| | APR-SEP | 2190 | 94 | 2870 | 1510 | 2610 | 1770 | 2330 |
| SHIELDS RIVER near Livingston | APR-JUL | 129 | 86 | 235 | 54 | 177 | 81 | 150 |
| | APR-SEP | 147 | 88 | 255 | 58 | 200 | 94 | 167 |
| BOULDER RIVER at Big Timber | APR-JUL | 325 | 92 | 415 | 225 | 415 | 235 | 353 |
| | APR-SEP | 345 | 90 | 435 | 240 | 445 | 245 | 384 |
| WEST ROSEBUD CREEK near Roscoe | APR-JUL | 59 | 92 | 76 | 42 | 77 | 41 | 64 |
| | APR-SEP | 75 | 90 | 92 | 58 | 98 | 52 | 83 |
| STILLWATER RIVER nr Absarokee 2 | APR-JUL | 490 | 94 | 670 | 305 | 670 | 310 | 524 |
| | APR-SEP | 585 | 94 | 785 | 380 | 800 | 375 | 625 |
| CLARKS FORK RIVER near Belfry | APR-JUL | 465 | 86 | 645 | 290 | 640 | 290 | 540 |
| | APR-SEP | 520 | 86 | 720 | 320 | 715 | 325 | 603 |
| COONEY RESERVOIR Inflow | APR-JUL | 39 | 80 | 68 | 11.6 | 56 | 22 | 49 |
| | APR-SEP | 48 | 80 | 81 | 16.8 | 68 | 28 | 60 |
| YELLOWSTONE RIVER at Billings 2 | APR-JUL | 3380 | 90 | | | 4170 | 2520 | 3740 |
| | APR-SEP | 4000 | 91 | | | 4970 | 3030 | 4410 |
| YELLOWSTONE RIVER at Miles City 2 | APR-JUL | 4930 | 87 | | | 6450 | 3410 | 5640 |
| | APR-SEP | 5730 | 88 | | | 7490 | 3970 | 6510 |
| YELLOWSTONE RIVER near Sidney 2 | APR-JUL | 5410 | 86 | | | 7230 | 3590 | 6260 |
| | APR-SEP | 6220 | 86 | | | 8310 | 4130 | 7200 |

## RESERVOIR STORAGE (1000AF)

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE ** THIS YEAR | LAST YEAR | AVG. |
|---|---|---|---|---|
| MYSTIC LAKE | 21.0 | 5.6 | 3.8 | 9.4 |
| COONEY | 27.4 | 19.2 | 20.2 | 13.8 |
| BIGHORN LAKE | 1356.0 | 707.1 | 862.1 | 683.0 |
| TONGUE RIVER | 68.0 | 39.1 | 22.6 | 27.7 |

## WATERSHED SNOWPACK ANALYSIS

| WATERSHED | NO. COURSES AVG'D | THIS YEAR AS % OF LAST YR. | AVERAGE |
|---|---|---|---|
| YELLOWSTONE ab LIVINGSTON | 17 | 147 | 89 |
| SHIELDS | 6 | 144 | 85 |
| BOULDER-STILLWATER | 3 | 160 | 97 |
| CLARK'S FORK-ROCK CREEK | 14 | 155 | 84 |
| YELLOWSTONE above BIGHORN | 31 | 151 | 86 |
| LITTLE BIGHORN | 5 | 112 | 79 |
| WIND RIVER (Wyoming) | 30 | 94 | 79 |
| BIGHORN RIVER (Wyoming) | 31 | 118 | 76 |
| BIGHORN BASIN (Total) | 56 | 111 | 79 |
| TONGUE RIVER (Wyoming) | 15 | 102 | 73 |
| POWDER RIVER (Wyoming) | 15 | 100 | 63 |
| YELLOWSTONE RIVER | 96 | 121 | 80 |

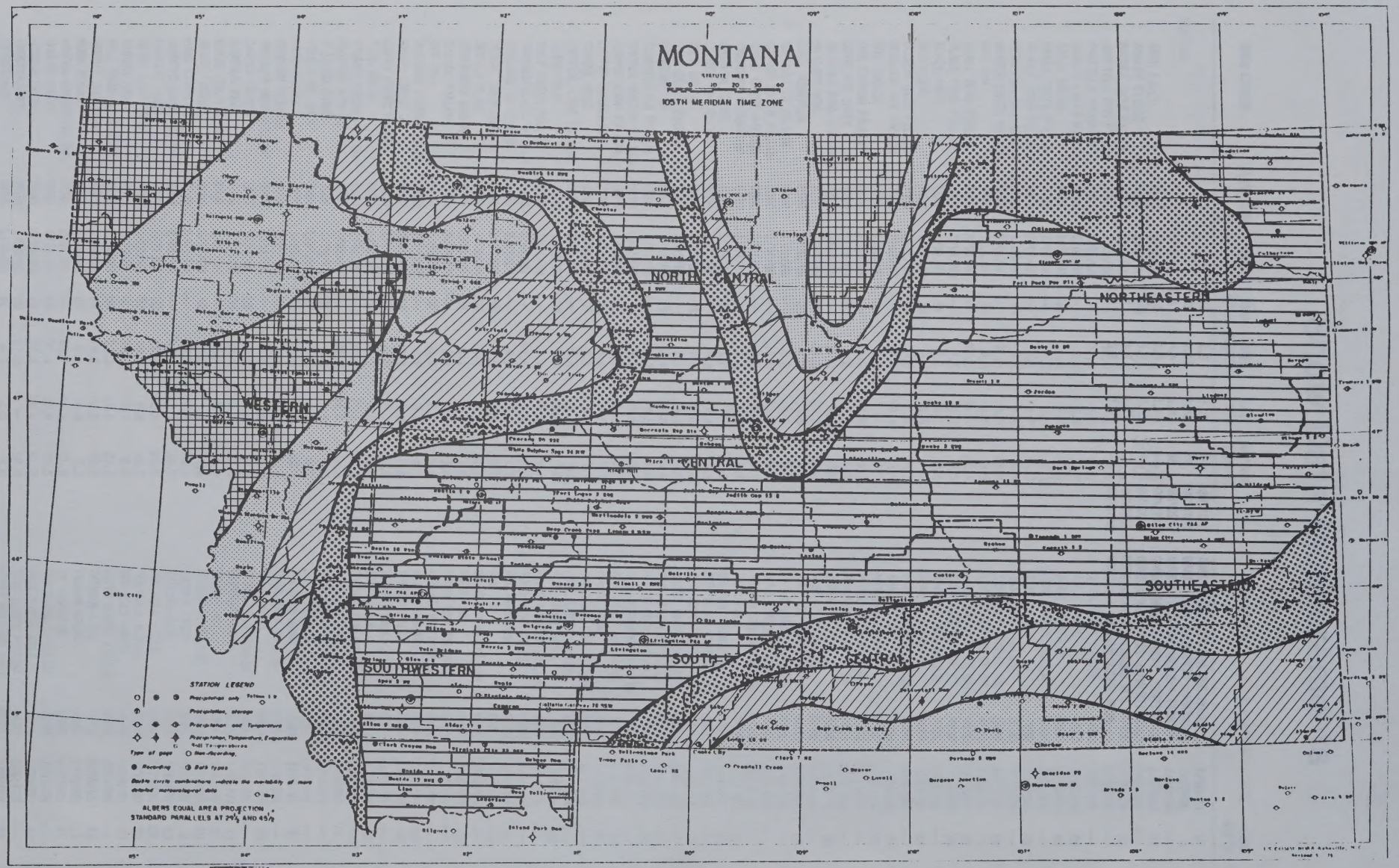
WET SUBS. and DRY SUBS. represent 150 and 50 percent subsequent precipitation events respectively.
REAS. MAX. and REAS. MIN. forecasts are for 10% and 90% exceedance levels with the exception of (1) below.
(1) - REAS. MAX. and REAS. MIN. forecasts are for 5% and 95% exceedance levels.
(2) - Corrected for upstream diversions or changes in reservoir storage.

# Snow Data Measurements

| SNOW COURSE | ELEVATION | DATE | SNOW DEPTH | WATER CONTENT | LAST YEAR | AVERAGE 1961-85 |
|---|---|---|---|---|---|---|
| MONTANA | | | | | | |
| ARCH FALLS | 7350 | 1/26/89 | 27 | 5.8 | 4.6 | 7.9 |
| ASHLEY DIVIDE | 4820 | 2/07/89 | 19 | 4.6 | 2.5 | 5.2 |
| BADGER PASS PILLOW | 6900 | 2/01/89 | --- | 24.3 | 13.7 | 22.8 |
| BANFIELD MTN PILLOW | 5600 | 2/01/89 | --- | 12.0 | 8.2 | 14.1 |
| BANFIELD MOUNTAIN | 5600 | 1/31/89 | 41 | 12.8 | 5.2 | 16.6 |
| BARKER LAKES PILLOW | 8250 | 2/01/89 | --- | 8.0 | 6.6 | 10.2 |
| BASIN CREEK | 7180 | 1/31/89 | 23 | 4.9 | 3.6 | 5.6 |
| BASIN CREEK PILLOW | 7180 | 2/01/89 | --- | 3.9 | 3.4 | 5.0 |
| BEAGLE SPGS PILLOW | 8850 | 2/01/89 | --- | 5.1 | 4.7 | 5.3 |
| BEAR PAW SKI AREA | 5200 | 1/28/89 | 15 | 3.2 | 4.0 | 4.9 |
| BEAVER CREEK PILLOW | 7850 | 2/01/89 | --- | 11.6 | 8.3 | 12.2 |
| BIG SKY | 7700 | 1/31/89 | 33 | 8.9 | 8.5 | 9.9 |
| BLACK BEAR PILLOW | 7950 | 2/01/89 | --- | 27.2 | 21.0 | 24.4 |
| BLACK PINE PILLOW | 7100 | 2/01/89 | --- | 7.8 | 6.8 | 9.5 |
| BLACK PINE | 7100 | 1/31/89 | 31 | 8.2 | 5.7 | 9.1 |
| BLACKTAIL | 5650 | 1/27/89 | 39 | 9.8 | 5.6 | — |
| BLOODY DICK PILLOW | 7550 | 2/01/89 | --- | 8.0 | 5.8 | 8.7 |
| BOULDER MTN PILLOW | 7950 | 2/01/89 | --- | 13.0 | 8.1 | 13.5 |
| BOX CANYON | 6670 | 1/25/89 | 33 | 6.9 | -- | 7.7 |
| BOX CANYON PILLOW | 6700 | 2/01/89 | --- | 5.7 | 3.9 | 6.3 |
| BOXELDER CREEK | 5100 | 1/28/89 | 20 | 3.5 | 4.0 | 6.0 |
| BRIDGER BOWL PILLOW | 7250 | 1/30/89 | --- | 13.0 | 9.8 | 16.9 |
| BRIDGER BOWL | 7250 | 1/30/89 | 49 | 16.3 | 10.7 | 18.0 |
| BULL MOUNTAIN | 6600 | 1/26/89 | 25 | 4.2 | 3.0 | 3.9 |
| CALVERT CR PILLOW | 6430 | 2/01/89 | --- | 5.9 | 4.8 | 6.4 |
| CARROT BASIN PILLOW | 9000 | 2/01/89 | --- | 17.8 | 11.3 | 18.0 |
| CASHE CREEK PILLOW | 7800 | 2/01/89 | --- | 6.6 | 5.5 | 6.0 |
| CHESSMAN RESERVOIR | 6200 | 1/27/89 | 17 | 3.2 | 1.4 | 2.8 |
| CHICKEN CREEK | 4060 | 1/24/89 | 48 | 13.2 | 7.2 | 11.0 |
| CLOVER MDW PILLOW | 8800 | 2/01/89 | --- | 9.3 | 7.3 | 11.1 |
| COLE CREEK | 7850 | 1/30/89 | 30 | 7.4 | 3.6 | 11.2 |
| COLE CREEK PILLOW | 7850 | 2/01/89 | --- | 6.2 | 4.1 | 10.5 |
| COMBINATION | 5600 | 1/31/89 | 15 | 3.4 | 3.0 | 3.8 |
| COMBINATION PILLOW | 5600 | 2/01/89 | --- | 3.7 | 3.3 | 4.0 |
| COPPER BOTTOM PILLOW | 5200 | 2/01/89 | --- | 8.7 | 5.8 | 9.2 |
| COPPER CAMP PILLOW | 6950 | 2/01/89 | --- | 20.9 | 12.7 | 23.6 |
| COPPER MOUNTAIN | 7700 | 1/25/89 | 36 | 6.4 | 4.6 | 7.5 |
| COYOTE HILL | 4200 | 1/31/89 | 30 | 8.1 | 5.8 | 7.8 |
| CRYSTAL LAKE PILLOW | 6050 | 2/01/89 | --- | 5.4 | 6.9 | 9.0 |
| DAISY PEAK | 7600 | 1/26/89 | 29 | 5.6 | 3.6 | 7.6 |
| DALY CREEK PILLOW | 5780 | 2/01/89 | --- | 6.4 | 5.7 | 9.1 |
| DARKHORSE LK. PILLOW | 8700 | 2/01/89 | --- | 14.6 | 10.8 | 16.5 |
| DEADMAN CR PILLOW | 6450 | 2/01/89 | --- | 6.9 | 5.2 | 7.3 |
| DESERT MOUNTAIN | 5600 | 2/07/89 | 32 | 8.8 | 4.6 | 10.7 |
| DEVILS SLIDE | 8100 | 1/26/89 | 39 | 10.4 | 7.2 | 14.5 |
| DISCOVERY BASIN | 7050 | 1/31/89 | 26 | 6.1 | 6.0 | 7.2 |
| DIVIDE PILLOW | 7800 | 2/01/89 | --- | 8.1 | 4.7 | 6.8 |
| DIX HILL | 6400 | 1/29/89 | 30 | 8.4 | 6.0 | 8.6 |
| DUPUYER CREEK PILLOW | 5750 | 2/01/89 | --- | 9.2 | 4.2 | 8.1 |
| EMERY CREEK | 4350 | 2/07/89 | 37 | 10.9 | 6.0 | 11.8 |
| EMERY CREEK PILLOW | 4350 | 2/01/89 | --- | 9.0 | 6.3 | 11.0 |
| FISH CREEK | 8000 | 1/31/89 | 24 | 5.1 | 3.6 | 6.4 |
| FISHER CREEK PILLOW | 9100 | 2/01/89 | --- | 22.6 | 15.5 | 24.9 |
| FLATTOP MTN PILLOW | 6300 | 2/01/89 | --- | 29.7 | 19.0 | 31.8 |
| FLEECER RIDGE | 7500 | 1/26/89 | 34 | 6.6 | 5.5 | 7.3 |
| FOURTH OF JULY | 3450 | 1/25/89 | 27 | 6.4 | 5.4 | 6.6 |
| FRIDAY HILL | 4620 | 1/25/89 | 50 | 13.6 | 8.3 | 14.7 |
| FROHNER MEADOWS | 6480 | 1/27/89 | 23 | 4.9 | 3.2 | 6.0 |
| FROHNER MDWS PILLOW | 6480 | 2/01/89 | --- | 4.9 | 3.0 | 6.3 |
| GARVER CREEK | 4250 | 1/31/89 | 29 | 7.2 | 4.3 | 8.3 |
| GIBBONS PASS | 7100 | 1/31/89 | 54 | 16.4 | 10.7 | 16.0 |
| GRAVE CRK PILLOW | 4300 | 2/01/89 | --- | 12.6 | 6.8 | 12.4 |
| GRAVE CREEK | 4300 | 2/07/89 | 40 | 13.2 | 7.6 | 11.8 |
| HAND CREEK PILLOW | 5030 | 2/01/89 | --- | 6.8 | 4.6 | 9.5 |
| HAWKINS LAKE PILLOW | 6450 | 2/01/89 | --- | 18.0 | 12.1 | 18.8 |
| HAWKINS LAKE | 6450 | 1/31/89 | 62 | 20.4 | 12.1 | 20.0 |
| HEART LAKE TRAIL | 4800 | 1/28/89 | 52 | 14.2 | 9.8 | 15.2 |
| HEBGEN DAM | 6550 | 1/26/89 | 40 | 10.2 | 5.4 | 8.6 |
| HELL ROARING DIVIDE | 5770 | 2/06/89 | 64 | 21.3 | 11.0 | 21.3 |
| HERRIG JUNCTION | 4850 | 1/24/89 | 64 | 18.2 | 11.3 | 18.3 |
| HOOD MEADOW | 6600 | 1/26/89 | 27 | 6.1 | 4.6 | 7.3 |
| HOODOO BASIN PILLOW | 6050 | 2/01/89 | --- | 28.7 | 20.1 | 31.9 |
| HOODOO BASIN | 6050 | 1/28/89 | 96 | 31.1 | 23.5 | 34.6 |
| HOODOO CREEK | 5900 | 1/28/89 | 89 | 27.6 | 19.4 | 31.7 |
| INDEPENDENCE | 7650 | 1/25/89 | 50 | 11.0 | -- | 12.0 |
| INTERGAARD | 6450 | 1/26/89 | 24 | 4.7 | 4.3 | 5.5 |
| JOHNSON PARK | 6450 | 1/26/89 | 26 | 4.8 | 3.5 | 5.0 |
| KINGS HILL | 7500 | 1/30/89 | 30 | 8.2 | 5.8 | 9.5 |
| KIWANIS CAMP | 3720 | 1/28/89 | 6 | 1.3 | 1.4 | 1.7 |
| KRAFT CREEK PILLOW | 4750 | 2/01/89 | --- | 12.1 | 6.0 | 8.9 |
| LAKEVIEW CANYON | 6930 | 1/26/89 | 34 | 8.4 | 4.3 | 8.2 |
| LAKEVIEW RDG. PILLOW | 7400 | 2/01/89 | --- | 9.6 | 4.9 | 8.7 |
| LAKEVIEW RIDGE | 7400 | 1/26/89 | 32 | 8.0 | 4.4 | 7.5 |
| LEMHI RIDGE PILLOW | 8100 | 2/01/89 | --- | 6.5 | 4.9 | 7.0 |
| LICK CREEK PILLOW | 6860 | 2/01/89 | --- | 6.7 | 4.6 | 6.1 |
| LICK CREEK | 6860 | 1/26/89 | 26 | 5.2 | 5.0 | 6.5 |
| LONE MOUNTAIN | 8880 | 1/31/89 | 43 | 13.5 | 9.6 | 15.7 |
| LOWER TWIN PILLOW | 7900 | 2/01/89 | --- | 12.2 | 7.3 | 13.5 |
| LOWER TWIN | 7900 | 1/31/89 | 49 | 15.3 | — | 15.0 |
| LUBRECHT PILLOW | 4680 | 2/01/89 | --- | 5.9 | 4.2 | 4.1 |
| LUBRECHT FOREST NO 3 | 5450 | 1/31/89 | 20 | 5.1 | 2.7 | 5.3 |
| LUBRECHT FOREST NO 4 | 4650 | 1/31/89 | 9 | 2.2 | 1.6 | 2.9 |
| LUBRECHT FOREST NO 6 | 4040 | 1/30/89 | 10 | 2.9 | 1.9 | 3.4 |
| LUBRECHT HYDROPLOT | 4200 | 1/31/89 | 19 | 4.4 | 3.0 | 5.8 |
| MADISON PLT PILLOW | 7750 | 2/01/89 | --- | 21.0 | -- | 15.6 |
| MANY GLACIER | 4900 | 2/05/89 | 44 | 13.6 | 5.8 | 14.5 |
| MANY GLACIER PILLOW | 4900 | 2/01/89 | --- | 10.6 | 5.4 | 13.2 |
| MARIAS PASS | 5250 | 1/29/89 | 35 | 10.4 | 5.1 | 11.6 |
| MAYNARD CREEK | 6210 | 1/30/89 | 32 | 9.0 | 6.3 | 10.4 |
| MAYNARD CR PILLOW | 6210 | 2/01/89 | --- | 7.6 | 5.0 | 8.0 |
| MONUMENT PK PILLOW | 8850 | 2/01/89 | --- | 11.7 | 7.8 | 13.9 |
| MONUMENT PEAK | 8850 | 1/25/89 | 58 | 14.0 | -- | 17.4 |
| MOSS PEAK PILLOW | 6780 | 2/01/89 | --- | 25.3 | 14.0 | 26.0 |
| MOULTON RESERVOIR | 6850 | 2/01/89 | 27 | 5.8 | 3.5 | 4.5 |
| MT LOCKHART PILLOW | 6400 | 2/01/89 | --- | 13.3 | 9.7 | 14.0 |
| MULE CREEK PILLOW | 8300 | 2/01/89 | --- | 9.6 | 7.0 | 8.6 |
| NEVADA CREEK PILLOW | 6480 | 2/01/89 | --- | 9.7 | 5.6 | 8.5 |
| NEW WORLD | 6900 | 1/27/89 | 31 | 7.9 | 7.8 | 10.0 |
| NEWTON MOUNTAIN | 5600 | 1/23/89 | 70 | 21.6 | 14.0 | 23.6 |
| NEZ PERCE CMP PILLOW | 5650 | 2/01/89 | --- | 10.7 | 8.7 | 9.9 |
| NEZ PERCE CREEK | 6600 | 1/25/89 | 22 | 3.8 | 3.0 | 4.8 |
| NOISY BASIN PILLOW | 6040 | 2/01/89 | --- | 28.5 | 15.6 | 28.6 |
| N.F. ELK CR PILLOW | 6250 | 2/01/89 | --- | 8.5 | 5.4 | 8.5 |
| NORTH FORK JOCKO | 6330 | 1/26/89 | 98 | 31.7 | 16.5 | 28.2 |
| N.E. ENTRANCE PILLOW | 7350 | 2/01/89 | --- | 5.5 | 4.1 | 6.3 |
| NORTHEAST ENTRANCE | 7350 | 2/02/89 | 29 | 5.9 | 3.6 | 6.8 |
| OPHIR PARK | 7150 | 1/29/89 | 38 | 11.0 | 7.4 | 11.6 |
| PICKFOOT CRK PILLOW | 6650 | 2/01/89 | --- | 6.5 | 4.3 | 6.9 |
| PIKE CREEK PILLOW | 5930 | 2/01/89 | --- | 16.7 | 10.9 | 18.5 |
| PIPESTONE PASS | 7200 | 1/25/89 | 24 | 3.6 | 2.0 | 3.5 |
| PLACER BASIN PILLOW | 8830 | 2/01/89 | --- | 12.6 | 7.1 | 10.8 |
| PORCUPINE PILLOW | 6500 | 2/01/89 | --- | 3.8 | 2.4 | 4.9 |
| RED MOUNTAIN | 6000 | 1/30/89 | 44 | 12.3 | 6.3 | 12.9 |
| RED TOP | 5260 | 1/30/89 | 44 | 12.3 | 11.0 | 19.6 |
| ROCKER PEAK PILLOW | 8000 | 2/01/89 | --- | 6.9 | 5.4 | 9.6 |
| ROCKY BOY | 4700 | 1/28/89 | 11 | 1.9 | 2.0 | 3.4 |
| ROCKY BOY PILLOW | 4700 | 1/28/89 | --- | 2.9 | 3.0 | 3.9 |
| SADDLE MTN PILLOW | 7900 | 2/01/89 | --- | 17.0 | 12.7 | 18.2 |
| SADDLE MOUNTAIN | 7940 | 1/31/89 | 59 | 18.5 | 11.4 | 17.6 |
| SHOWER FALLS | 8100 | 1/26/89 | 40 | 10.7 | 8.3 | 15.7 |
| SHOWER FALLS PILLOW | 8100 | 2/01/89 | --- | 10.1 | 9.6 | 15.5 |
| SILVER RUN | 6630 | 1/30/89 | 10 | 2.1 | 1.1 | 3.6 |
| SILVER RUN PILLOW | 6630 | 2/01/89 | --- | 3.1 | 2.3 | 3.6 |
| SKALKAHO PILLOW | 7260 | 2/01/89 | --- | 14.5 | 12.1 | 16.8 |
| SKYLARK TRAIL PILLOW | 6200 | 2/01/89 | --- | 24.4 | 15.7 | 20.1 |
| S.F. SHIELDS PILLOW | 8100 | 2/01/89 | --- | 9.2 | 6.6 | 11.4 |
| SPOTTED BEAR MTN. | 7000 | 2/08/89 | 37 | 10.7 | 6.8 | 10.6 |
| SPUR PARK PILLOW | 8100 | 2/01/89 | --- | 13.6 | 8.5 | 15.0 |
| STAHL PEAK | 6030 | 2/07/89 | 78 | 27.4 | 13.8 | 26.5 |
| STAHL PEAK PILLOW | 6030 | 2/01/89 | --- | 24.7 | 12.7 | 25.1 |
| STRYKER BASIN | 6180 | 1/24/89 | 73 | 22.9 | 10.8 | 21.7 |
| STUART MILL | 6500 | 1/26/89 | 23 | 4.5 | 4.3 | 4.4 |
| STUART MOUNTAIN | 7400 | 1/26/89 | 66 | 20.2 | 14.8 | 21.9 |
| SUCKER CREEK | 3960 | 1/28/89 | 0 | .0 | .0 | .7 |
| TAYLOR ROAD | 4080 | 1/28/89 | 13 | 2.6 | 2.0 | 3.1 |
| TEN MILE LOWER | 6600 | 1/26/89 | 26 | 5.1 | 3.2 | 5.2 |
| TEN MILE MIDDLE | 6800 | 1/26/89 | 32 | 6.3 | 4.3 | 7.8 |
| TEN MILE UPPER | 8000 | 1/26/89 | 33 | 7.4 | 5.0 | 9.5 |
| TEPEE CREEK PILLOW | 8000 | 2/01/89 | --- | 9.3 | 6.5 | 8.9 |
| TRINKUS LAKE | 6100 | 2/08/89 | 79 | 28.8 | 19.1 | 26.7 |
| TRUMAN CREEK | 4060 | 1/30/89 | 14 | 3.2 | 1.6 | 3.1 |
| TV MOUNTAIN | 6800 | 1/26/89 | 41 | 11.4 | 8.5 | 12.6 |
| TWELVEMILE PILLOW | 5600 | 2/01/89 | --- | 13.2 | 10.2 | 12.7 |
| TWENTY-ONE MILE | 7150 | 1/29/89 | 47 | 12.4 | 7.2 | 12.3 |
| TWIN LAKES PILLOW | 6400 | 2/01/89 | --- | 27.2 | 19.6 | 29.0 |
| UPPER HOLLAND LAKE | 6200 | 2/08/89 | 72 | 25.5 | 15.9 | 24.0 |
| WALDRON PILLOW | 5600 | 2/01/89 | --- | 7.3 | 4.8 | 7.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| WARM SPRINGS PILLOW | 7800 | 2/01/89 | --- | 11.5 | 9.2 | 17.6 |
| WEASEL DIVIDE | 5450 | 2/07/89 | 71 | 24.6 | 14.0 | 23.0 |
| WEST YELLOWSTONE | 6700 | 1/29/89 | 36 | 8.2 | 4.4 | 8.2 |
| WHISKEY CREEK PILLOW | 6800 | 2/01/89 | --- | 13.9 | 8.3 | 11.1 |
| WHITE MILL PILLOW | 8700 | 2/01/89 | --- | 15.3 | 9.6 | 17.0 |
| WILLOW CREEK | 6500 | 1/30/89 | 17 | 3.9 | 2.0 | 5.6 |
| WOOD CREEK PILLOW | 5960 | 2/01/89 | --- | 6.5 | 3.8 | 6.9 |

# Valley Precipitation




Over 130%

110 - 130%

90 - 110%

70 - 90%

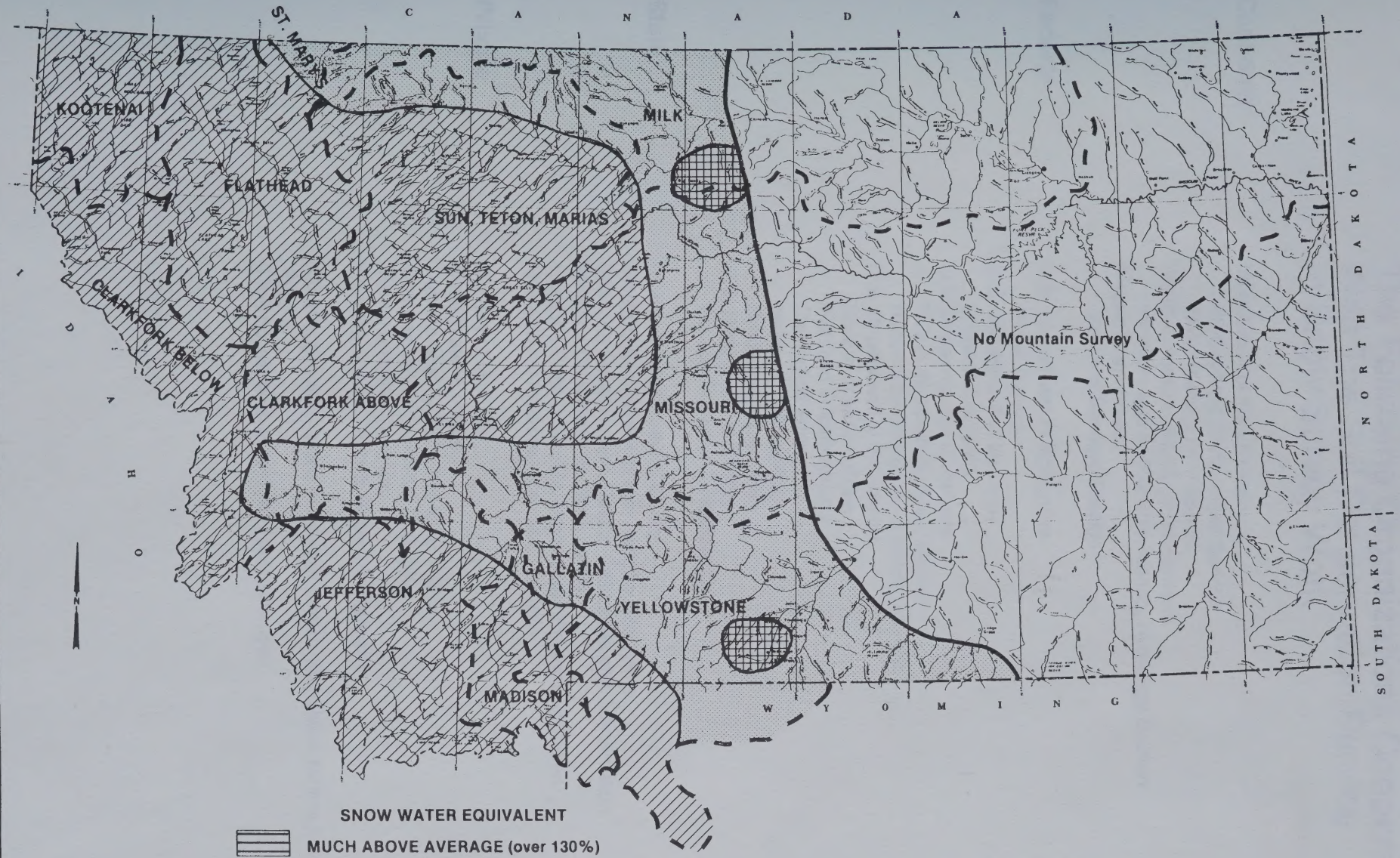
Under 70%

Source: NWS
Great Falls, MT

JANUARY 1989

U.S DEPARTMENT OF AGRICULTURE

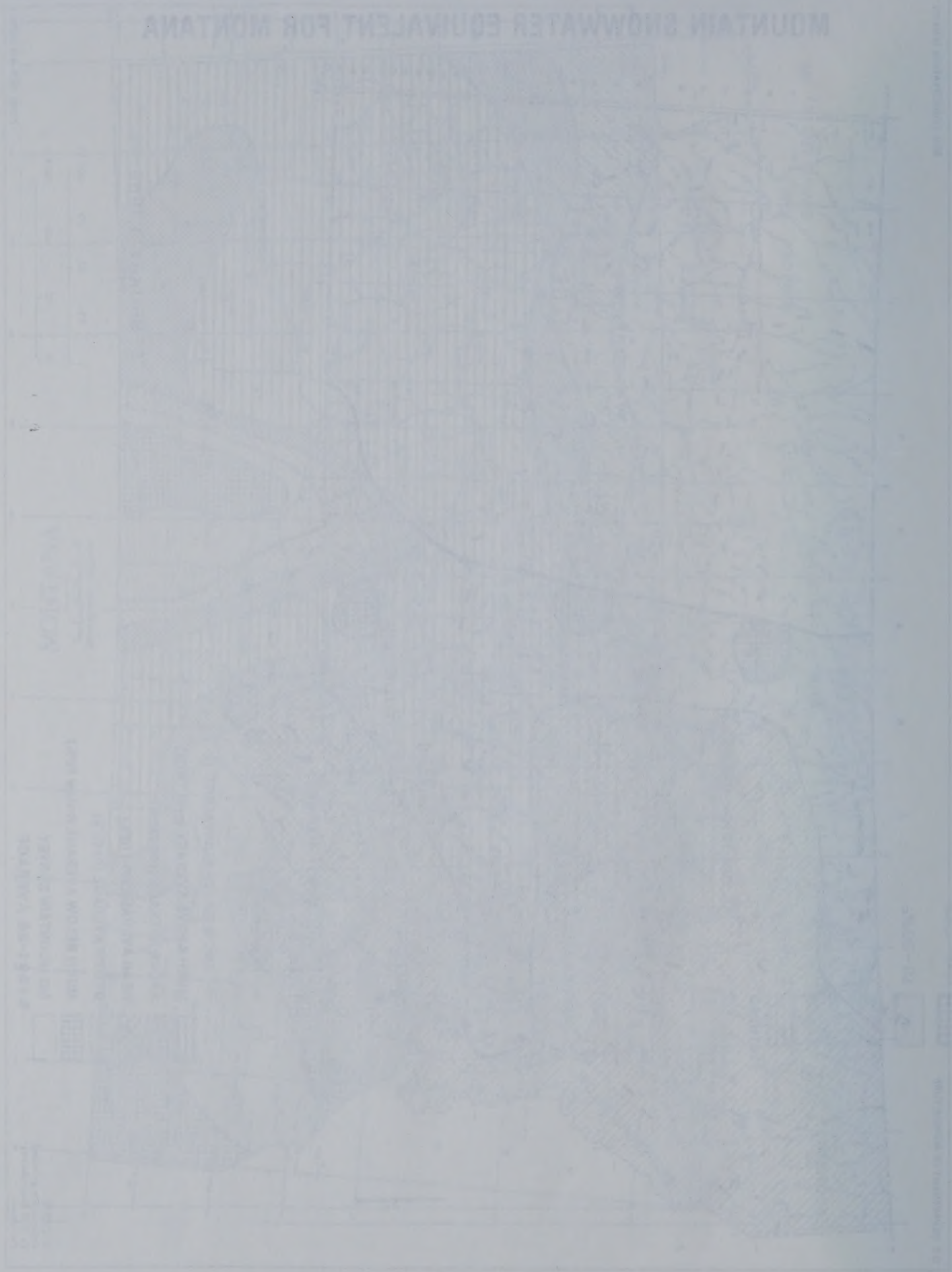
SOIL CONSERVATION SERVICE




# MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA

*SOURCE:*
*Information provided by SCS Snow Survey Personnel*

JUNE 1985 4-R-39296-1



# The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

**Canadian**

Department of the Environment
- Atmospheric Environment Service
- Water Management Service

British Columbia Ministry of Environment
- Inventory and Engineering Branch, Hydrology Section

Alberta Environment
- Technical Services Division

**Federal**

U.S. Department of Agriculture
- Forest Service

U.S. Department of the Army
- Corps of Engineers

U.S. Department of Commerce
- NOAA, National Weather Service
- National Environmental Satellite Service

U.S. Department of the Interior
- Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation

U.S. Department of Energy
- Bonneville Power Administration

**State**

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

**Private**

Big Sky of Montana
Butte Water Company
Confererated Salish & Kootenai Tribes
Flathead Valley Comminity College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.
Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
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# Montana
# Water Supply Outlook

and

Federal-State-Private
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